Appendix D
Additional Information to Support Resource Analyses

Appendix D

D. ADDITIONAL INFORMATION TO SUPPORT RESOURCE ANALYSES

TABLES

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FIGURES

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Appendix D

D.1 ADDITIONAL ANALYSES FOR THE FOREST STRUCTURE AND VEGETATION SECTION

D.1.1 Site Class

Site class indicates the productivity of an area to grow a given species of tree. Site class is based on site index, which is the expected height of a dominant tree at a specific index age (generally a 50 years breast-height age). Site Class I represents the highest productivity and Site Class V the lowest. Site class is a factor in determining the biological productivity and economic potential of a stand and will influence the frequency of harvest of a stand.

Table D-1 displays site class acres in each of DNR's HCP Planning Units in western Washington. Site class is predominantly moderate to high on forested trust land in western Washington. Four percent of these lands are highly productive Site Class I. Site Class II covers 30 percent of the forested trust lands. Site Class III covers approximately 44 percent of the forested trust lands. Site Class IV and Site Class V are found on 18 and 5 percent of the area, respectively.

The Columbia, North Puget, and Straits HCP Planning Units contain the most productive forest sites. These three units contain over 90 percent of Site Class I lands and 80 percent of Site Class II lands in the western Washington forested state trust lands. Site Class III occurs on 10 to 25 percent of the forestland in each HCP Planning unit. More than 60 percent of Site Class V lands are in the North Puget HCP Planning Unit.

D.1.2 Additional Information on Current Conditions

Figure D-1 shows the age class distribution for forested trust lands. Table D-2 summarizes standing volume changes by land class, HCP Planning Unit, and Alternative.

Table D-1. Site Class for Western Washington Forested Trust Lands, by HCP Planning Unit

HCP Planning Unit	Site Class									
	I		II		III		IV		V	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Straits	9,275	3%	98,741	37%	102,651	38%	48,564	18%	8,299	3%
North Puget	15,506	4%	95,098	25%	152,378	40%	75,936	20%	42,598	11%
South Puget	3,076	1%	36,689	14%	156,465	61%	52,875	21%	7,554	3%
Columbia	23,844	10%	138,845	60%	64,177	28%	4,540	2%	1,526	1%
South Coast	1,580	1%	31,653	22%	69,255	49%	34,950	25%	4,405	3%
OESF	410	0%	10,456	9%	62,396	57%	32,864	30%	4,095	4%
Total Acres	**53,690**	**4%**	**411,482**	**30%**	**607,322**	**44%**	**249,729**	**18%**	**68,477**	**5%**

Data Source: Model output data – SDS. Some percentages do not sum to 100 due to rounding.

OESF = Olympic Experimental State Forest

Figure D-1. Age Class Distribution for Forested Trust Lands (2004)

D.1.3 Harvest Intensity

Figures D-2, D-3, and D-4 graphically display the variations in distribution of management intensity by land class that would result from differing policy and procedures among Alternatives. Harvest intensity under Alternative 1 would be low in all land classes when compared to other Alternatives because of constraints that reduce the land base for harvest. Under Alternative 4, harvest intensity would be similar to Alternative 1, reflecting the combination of harvest constraints in riparian areas and proposed longer harvest maturity criteria. Alternatives 2, 3, 5, and the Preferred Alternative would have higher harvest intensity. Some lands that currently have harvest restrictions would be available for harvest under these four Alternatives through policy change and increased commitment of resources. Under Alternative 5, a younger maturity criterion (50 years) would increase harvest intensity over Alternatives 1, 2, 3, and 4.

Figure D-5 displays harvest type (low, moderate, and high volume removal) over time by Alternative, expressed as a percent of the total forested trust lands. The figure graphically displays lower harvest intensity in Alternatives 1 and 4 that would use passive management strategies compared to Alternatives 5 and the PA, and, to a lesser extent, Alternative 3. Under Alternative 3, harvest intensity would show more variability over time because of the wider allowable fluctuation in decadal harvest targets. The intensive management strategy proposed under Alternatives 5 and the PA would result in higher harvest intensity levels, partly due to higher amounts of thinning. Under the PA, biodiversity pathways management would entail multiple harvest entries to encourage the development of stand structure needed for wildlife habitat and riparian structure.

Table D-2. Summary of Standing Volume Changes (billion board feet Scribner) by Land Class, HCP Planning Unit, and Alternative

Alternative	HCP Planning Unit	Year	Uplands with General Objectives	Uplands with Specific Objectives	Riparian and Wetland Areas	Total
Alt.1	Colombia	2004	1.9	2.4	2.2	**6.5**
		2013	1.8	2.8	2.7	**7.3**
		2031	1.8	3.4	3.7	**9.0**
		2067	2.0	4.0	5.1	**11.1**
	North Puget	2004	1.7	4.3	2.2	**8.3**
		2013	1.5	5.0	2.7	**9.2**
		2031	1.5	6.4	3.7	**11.6**
		2067	1.6	8.2	5.0	**14.7**
	OESF	2004	0.0	2.7	2.1	**4.8**
		2013	0.0	3.6	2.8	**6.4**
		2031	0.0	5.4	4.4	**9.7**
		2067	0.0	7.8	6.5	**14.4**
	South Coast	2004	2.6	1.1	2.1	**5.8**
		2013	2.7	1.3	2.7	**6.6**
		2031	3.1	1.5	3.7	**8.3**
		2067	3.7	1.9	5.1	**10.7**
	South Puget	2004	0.4	1.8	0.8	**3.0**
		2013	0.3	2.0	1.0	**3.3**
		2031	0.3	2.7	1.3	**4.3**
		2067	0.5	3.2	1.8	**5.4**
	Straits	2004	1.0	0.8	0.5	**2.3**
		2013	1.0	0.9	0.5	**2.5**
		2031	1.2	1.1	0.7	**3.0**
		2067	1.7	1.3	0.9	**4.0**
Alt.2	Colombia	2004	1.9	2.4	2.2	**6.5**
		2013	2.0	2.5	2.7	**7.2**
		2031	2.0	2.8	3.6	**8.4**
		2067	2.7	3.0	4.8	**10.5**
	North Puget	2004	1.8	4.3	2.2	**8.3**
		2013	1.7	4.6	2.7	**9.0**
		2031	1.9	5.3	3.6	**10.8**
		2067	1.9	5.8	4.7	**12.4**
	OESF	2004	0.0	2.7	2.1	**4.8**
		2013	0.0	3.3	2.8	**6.0**
		2031	0.0	4.3	4.1	**8.4**
		2067	0.0	4.6	5.5	**10.1**
	South Coast	2004	2.7	1.1	2.1	**5.9**
		2013	2.6	1.1	2.6	**6.3**
		2031	2.8	1.1	3.6	**7.5**
		2067	3.1	1.0	4.8	**8.9**

Table D-2. Summary of Standing Volume Changes (billion board feet Scribner) by Land Class, HCP Planning Unit, and Alternative (continued)

Alternative	HCP Planning Unit	Year	Uplands with General Objectives	Uplands with Specific Objectives	Riparian and Wetland Areas	Total
	South Puget	2004	0.4	1.8	0.8	**2.9**
		2013	0.4	1.8	0.9	**3.2**
		2031	0.4	2.0	1.3	**3.7**
		2067	0.6	2.3	1.7	**4.6**
	Straits	2004	1.0	0.8	0.5	**2.2**
		2013	1.0	0.8	0.5	**2.3**
		2031	1.1	0.8	0.7	**2.6**
		2067	1.4	0.9	0.9	**3.2**
Alt.3	Colombia	2004	1.9	2.4	2.2	**6.5**
		2013	1.6	2.4	2.6	**6.7**
		2031	1.2	2.5	3.5	**7.3**
		2067	1.8	2.7	4.6	**9.1**
	North Puget	2004	1.8	4.3	2.2	**8.3**
		2013	1.8	4.9	2.7	**9.4**
		2031	1.4	5.2	3.5	**10.1**
		2067	1.4	5.5	4.5	**11.4**
	OESF	2004	0.0	2.7	2.1	**4.8**
		2013	0.0	3.6	2.8	**6.4**
		2031	0.0	4.8	4.3	**9.1**
		2067	0.0	4.7	5.9	**10.5**
	South Coast	2004	2.7	1.1	2.1	**5.9**
		2013	2.1	1.1	2.6	**5.8**
		2031	1.8	1.0	3.5	**6.4**
		2067	2.4	0.9	4.6	**8.0**
	South Puget	2004	0.4	1.7	0.8	**2.9**
		2013	0.3	1.7	0.9	**2.9**
		2031	0.3	2.1	1.2	**3.6**
		2067	0.5	2.4	1.7	**4.6**
	Straits	2004	1.0	0.8	0.5	**2.2**
		2013	0.8	0.8	0.5	**2.1**
		2031	0.7	0.7	0.7	**2.0**
		2067	0.8	0.7	0.8	**2.3**
Alt.4	Colombia	2004	1.9	2.4	2.2	**6.5**
		2013	1.9	2.8	2.7	**7.4**
		2031	1.9	3.4	3.7	**9.0**
		2067	2.0	3.6	5.0	**10.6**
	North Puget	2004	1.7	4.3	2.2	**8.2**
		2013	1.7	4.8	2.7	**9.2**
		2031	1.7	5.9	3.6	**11.2**
		2067	1.8	7.2	4.9	**13.9**

Table D-2. Summary of Standing Volume Changes (billion board feet Scribner) by Land Class, HCP Planning Unit, and Alternative (continued)

Alternative	HCP Planning Unit	Year	Uplands with General Objectives	Uplands with Specific Objectives	Riparian and Wetland Areas	Total
	OESF	2004	0.0	2.7	2.1	**4.8**
		2013	0.0	3.6	2.8	**6.5**
		2031	0.0	5.6	4.4	**10.1**
		2067	0.0	8.6	6.8	**15.4**
	South Coast	2004	2.6	1.1	2.1	**5.8**
		2013	2.7	1.2	2.6	**6.5**
		2031	2.5	1.3	3.6	**7.5**
		2067	3.0	1.4	4.9	**9.3**
	South Puget	2004	0.4	1.8	0.8	**3.1**
		2013	0.4	2.1	1.0	**3.5**
		2031	0.5	2.7	1.3	**4.5**
		2067	0.5	3.4	1.7	**5.7**
	Straits	2004	1.0	0.8	0.5	**2.3**
		2013	1.0	0.8	0.5	**2.4**
		2031	1.1	0.9	0.7	**2.7**
		2067	1.3	1.0	0.9	**3.2**
Alt.5	Colombia	2004	1.7	2.3	2.2	**6.2**
		2013	1.6	2.2	2.6	**6.4**
		2031	1.2	2.0	3.5	**6.7**
		2067	1.5	1.9	4.6	**8.1**
	North Puget	2004	1.7	4.3	2.2	**8.2**
		2013	1.8	4.7	2.7	**9.1**
		2031	1.1	4.7	3.5	**9.4**
		2067	1.5	5.4	4.6	**11.5**
	OESF	2004	0.0	2.7	2.2	**4.9**
		2013	0.0	2.4	2.8	**5.2**
		2031	0.0	2.0	4.1	**6.1**
		2067	0.0	2.2	5.8	**7.9**
	South Coast	2004	2.5	1.1	2.1	**5.7**
		2013	2.4	1.0	2.6	**6.1**
		2031	1.9	0.9	3.5	**6.4**
		2067	2.3	1.0	4.7	**7.9**
	South Puget	2004	0.4	1.7	0.8	**2.9**
		2013	0.3	1.7	0.9	**2.9**
		2031	0.3	1.6	1.2	**3.1**
		2067	0.4	1.6	1.6	**3.6**
	Straits	2004	0.9	0.8	0.5	**2.2**
		2013	0.8	0.7	0.5	**2.0**
		2031	0.7	0.6	0.7	**2.0**
		2067	0.8	0.6	0.8	**2.3**

Table D-2. Summary of Standing Volume Changes (billion board feet Scribner) by Land Class, HCP Planning Unit, and Alternative (continued)

Alternative	HCP Planning Unit	Year	Uplands with General Objectives	Uplands with Specific Objectives	Riparian and Wetland Areas	Total
PA	Colombia	2004	1.9	2.4	2.2	**6.5**
		2013	1.4	2.3	2.6	**6.4**
		2031	1.4	2.5	3.2	**7.1**
		2067	1.9	2.4	3.9	**8.2**
	North Puget	2004	1.6	4.3	2.2	**8.1**
		2013	1.4	4.6	2.6	**8.6**
		2031	1.3	5.4	3.2	**10.0**
		2067	2.0	6.2	4.0	**12.3**
	OESF	2004	0.0	2.8	2.2	**5.0**
		2013	0.0	3.1	2.7	**5.8**
		2031	0.0	3.7	3.9	**7.5**
		2067	0.0	4.5	5.0	**9.5**
	South Coast	2004	2.6	1.1	2.1	**5.9**
		2013	2.1	1.1	2.6	**5.8**
		2031	2.1	1.2	3.1	**6.4**
		2067	3.2	1.3	3.7	**8.2**
	South Puget	2004	0.4	1.8	0.8	**3.0**
		2013	0.4	1.8	0.9	**3.0**
		2031	0.4	2.1	1.2	**3.7**
		2067	0.6	2.1	1.4	**4.1**
	Straits	2004	0.9	0.8	0.4	**2.1**
		2013	0.8	0.8	0.5	**2.0**
		2031	0.9	0.8	0.5	**2.2**
		2067	1.3	0.8	0.6	**2.7**

OESF = Olympic Experimental State Forest

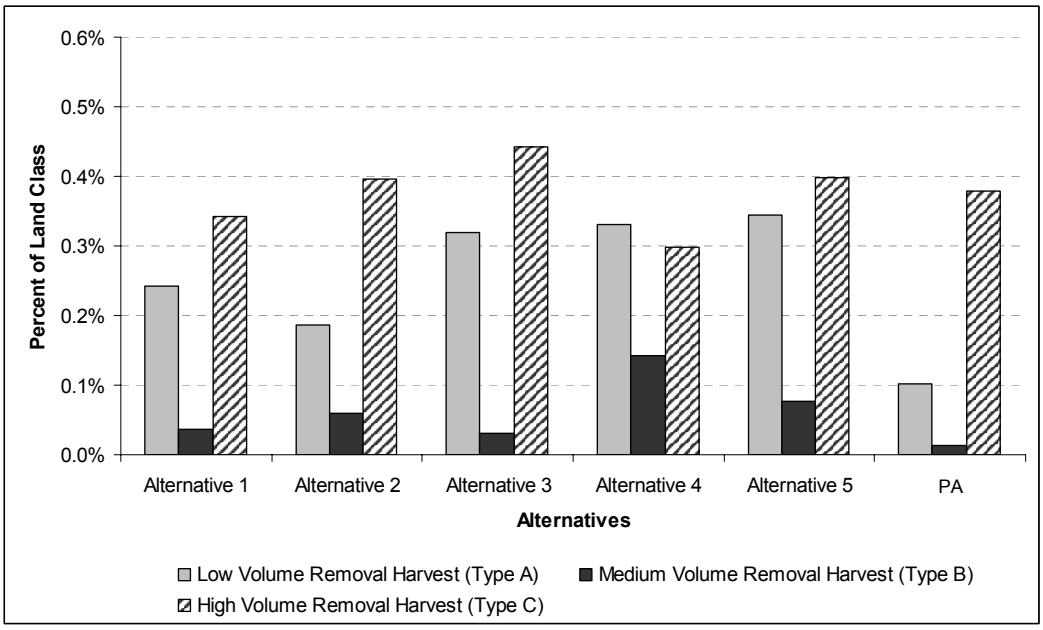

Figure D-2. Harvest Intensity in Forested Trust Uplands with General Management Objectives Land Class (annual average percent of total forest base area by harvest type over the analysis period)

Data Source: Model output data (Timber Flow Level)

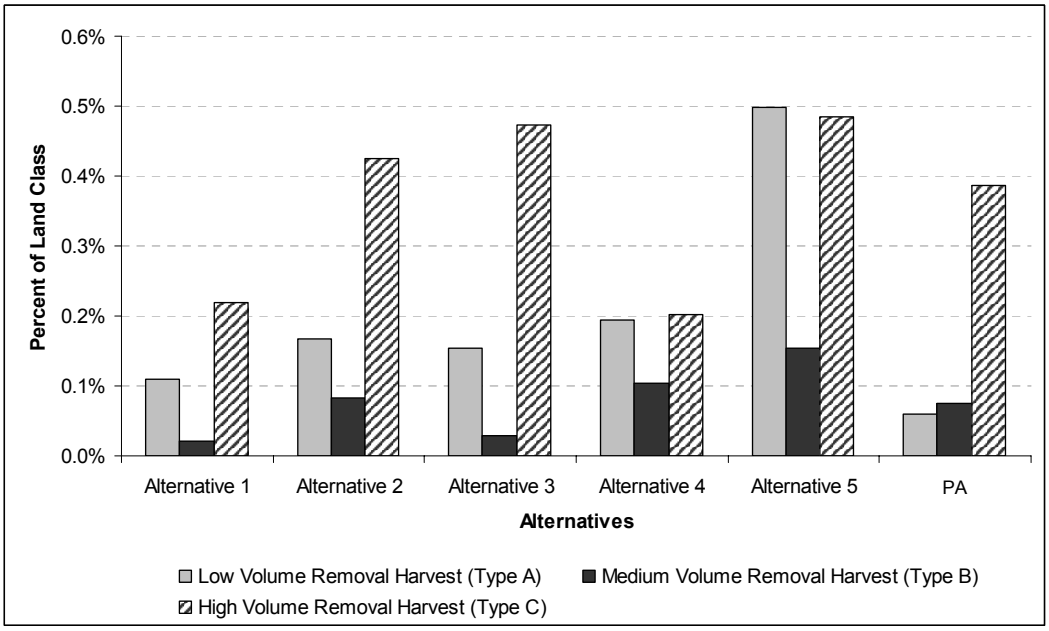

Figure D-3. Harvest Intensity in Forested Trust Uplands with Specific Management Objectives Land Class (annual average percent of total forest base area by harvest type over the analysis period)

Data Source: Model output data (Timber Flow Level)

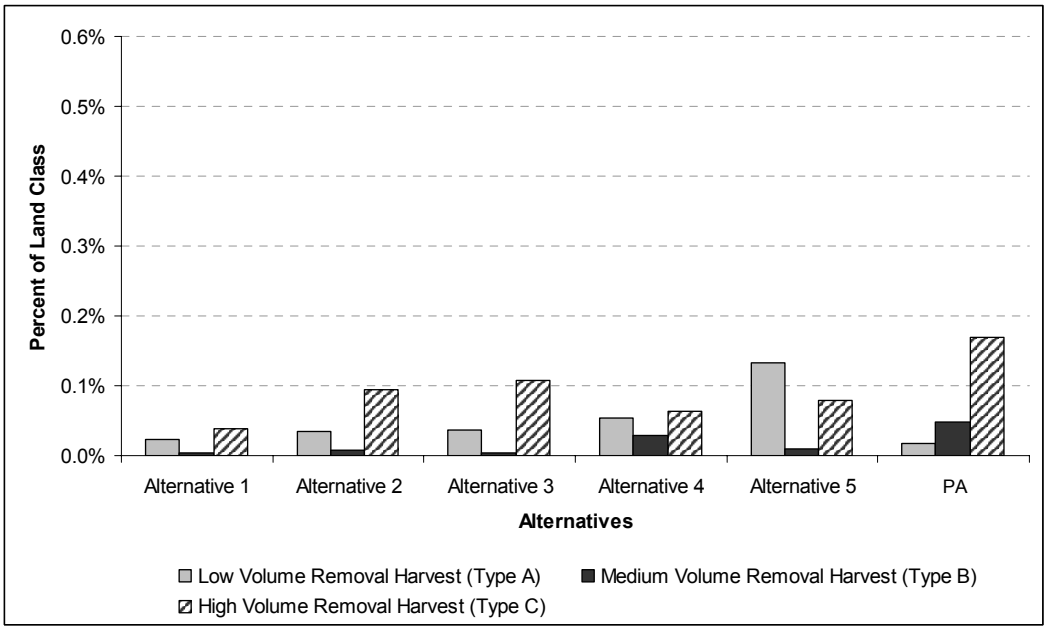

Figure D-4. Harvest Intensity on Forested Trust Lands in the Riparian and Wetland Land Class (annual average percent of total forest base area by harvest type over the analysis period)
Data Source: Model output data (Timber Flow Level)

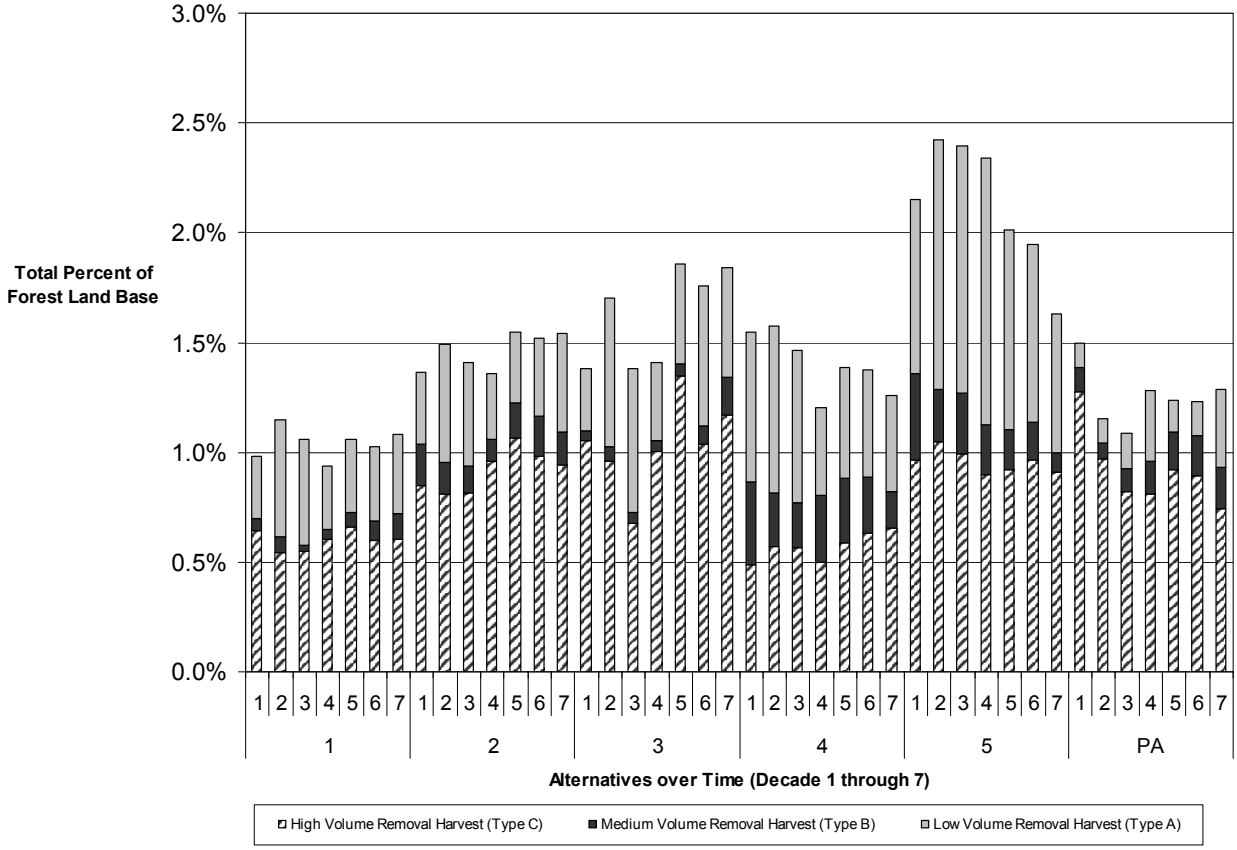

Figure D-5. Harvest Type by Alternative (average annual percent by decade of Forested Trust Lands by harvest type)
Data Source: Model output data (Timber Flow Level)

Harvest intensity viewed at the planning unit level shows a similar pattern, with the following exceptions (Tables D-3 and D-4). The Olympic Experimental State Forest HCP Planning Unit would consistently have lower harvest levels than the other HCP Planning units in Alternatives 1, 2, 3 and 4. Under Alternatives 5 and the PA, there is an increased percentage of low volume removal harvest in the Olympic Experimental State Forest. In Alternatives 1, 2, 3, and 4, the South Coast HCP Planning Unit would have a slightly higher harvest intensity than the other HCP Planning Units.

Tables D-5 through D-7 show the percent of each land class area in which timber harvest activities would occur per decade under each alternative by HCP Planning Unit. Table D-8 shows the percentage of land class area expected in three stand development stage categories by HCP Planning Unit and year for the alternatives.

Appendix D

Table D-3. Average Annual Harvest Area over 64 Years as a Percent of Forested Trust Lands within HCP Planning Units

Alternatives	HCP Planning Unit	Low Volume Removal Harvest (Harvest Type A)	Medium Volume Removal Harvest (Harvest Type B)	High Volume Removal Harvest (Harvest Type C)
Alt.1	Columbia	0.5%	0.1%	0.8%
	North Puget	0.4%	0.1%	0.6%
	OESF	0.0%	0.0%	0.2%
	South Coast	0.5%	0.1%	0.8%
	South Puget	0.5%	0.1%	0.7%
	Straits	0.3%	0.1%	0.5%
Alt.2	Columbia	0.3%	0.1%	0.7%
	North Puget	0.7%	0.2%	1.2%
	OESF	0.2%	0.0%	0.8%
	South Coast	0.8%	0.4%	1.9%
	South Puget	0.5%	0.2%	1.1%
	Straits	0.2%	0.1%	0.4%
Alt.3	Columbia	0.6%	0.1%	1.2%
	North Puget	1.0%	0.1%	1.4%
	OESF	0.1%	0.0%	1.5%
	South Coast	1.5%	0.1%	2.7%
	South Puget	0.2%	0.0%	0.5%
	Straits	0.2%	0.0%	0.4%
Alt.4	Columbia	0.7%	0.4%	0.8%
	North Puget	1.8%	0.7%	1.6%
	OESF	0.1%	0.1%	0.2%
	South Coast	0.7%	0.3%	0.8%
	South Puget	0.2%	0.1%	0.2%
	Straits	0.4%	0.2%	0.3%
Alt.5	Columbia	1.9%	0.5%	2.0%
	North Puget	2.5%	0.5%	2.9%
	OESF	1.2%	0.1%	0.9%
	South Coast	0.6%	0.2%	0.6%
	South Puget	0.6%	0.2%	0.5%
	Straits	0.6%	0.2%	0.5%
PA	Columbia	0.6%	0.3%	2.7%
	North Puget	0.2%	0.2%	1.1%
	OESF	0.0%	0.0%	0.5%
	South Coast	0.2%	0.1%	1.1%
	South Puget	0.1%	0.1%	0.5%
	Straits	0.3%	0.2%	0.7%

1/ OESF = Olympic Experimental State ForestData
Source: Model output data (Timber Flow Level)

Table D-4. Summary of Management Intensity for HCP Planning Units by Alternative

	Decadal Acres Harvested by Type of Harvest (Volume of Harvest Removed)			
Alternative 1				
HCP Planning Unit	**Low Volume Removal Harvest (Harvest Type A)**	**Medium Volume Removal Harvest (Harvest Type B)**	**High Volume Removal Harvest (Harvest Type C)**	**All Types**
Columbia	12,570	2,110	21,006	35,686
North Puget	16,834	1,914	22,238	40,987
Olympic Experimental State Forest	1,020	189	5,944	7,153
South Coast	11,316	1,736	19,010	32,062
South Puget	7,394	1,658	10,130	19,181
Straits	3,202	1,019	5,117	9,339
Grand Total	**52,335**	**8,626**	**83,446**	**144,407**
Alternative 2				
HCP Planning Unit	**Low Volume Removal Harvest (Harvest Type A)**	**Medium Volume Removal Harvest (Harvest Type B)**	**High Volume Removal Harvest (Harvest Type C)**	**All Types**
Columbia	10,291	3,659	27,249	41,199
North Puget	19,100	5,760	31,742	56,602
Olympic Experimental State Forest	4,079	477	17,909	22,465
South Coast	11,040	5,149	27,248	43,436
South Puget	5,298	2,409	12,596	20,303
Straits	4,379	3,352	10,520	18,250
Grand Total	**54,186**	**20,805**	**127,264**	**202,256**
Alternative 3				
HCP Planning Unit	**Low Volume Removal Harvest (Harvest Type A)**	**Medium Volume Removal Harvest (Harvest Type B)**	**High Volume Removal Harvest (Harvest Type C)**	**All Types**
Columbia	16,299	2,654	30,753	49,706
North Puget	22,751	2,444	32,945	58,141
Olympic Experimental State Forest	1,942	512	21,768	24,223
South Coast	16,696	1,628	29,633	47,956
South Puget	5,046	767	13,892	19,705
Straits	8,075	986	13,379	22,440
Grand Total	**70,810**	**8,991**	**142,370**	**222,171**
Alternative 4				
HCP Planning Unit	**Low Volume Removal Harvest (Harvest Type A)**	**Medium Volume Removal Harvest (Harvest Type B)**	**High Volume Removal Harvest (Harvest Type C)**	**All Types**
Columbia	17,453	8,900	18,396	44,749
North Puget	25,815	9,481	23,001	58,296
Olympic Experimental State Forest	1,130	1,348	2,161	4,639
South Coast	18,994	9,330	20,767	49,091
South Puget	7,883	3,938	6,630	18,450
Straits	9,208	5,140	7,305	21,653
Grand Total	**80,483**	**38,136**	**78,260**	**196,879**

Table D-4. Summary of Management Intensity for HCP Planning Units by Alternative (continued)

	Decadal Acres Harvested by Type of Harvest (Volume of Harvest Removed)			
Alternative 5				
HCP Planning Unit	**Low Volume Removal Harvest (Harvest Type A)**	**Medium Volume Removal Harvest (Harvest Type B)**	**High Volume Removal Harvest (Harvest Type C)**	**All Types**
Columbia	27,453	6,607	27,941	62,001
North Puget	27,530	6,044	31,978	65,552
Olympic Experimental State Forest	30,937	3,797	23,997	58,732
South Coast	21,188	8,160	24,763	54,111
South Puget	15,015	4,832	13,356	33,203
Straits	13,501	3,966	11,533	29,000
Grand Total	**135,625**	**33,406**	**133,568**	**302,599**
Preferred Alternative				
HCP Planning Unit	**Low Volume Removal Harvest (Harvest Type A)**	**Medium Volume Removal Harvest (Harvest Type B)**	**High Volume Removal Harvest (Harvest Type C)**	**All Types**
Columbia	6,463	3,781	29,694	39,938
North Puget	5,569	4,437	30,407	40,414
Olympic Experimental State Forest	1,649	1,577	20,157	23,383
South Coast	4,666	3,792	27,401	35,859
South Puget	2,796	2,735	11,899	17,430
Straits	3,756	2,576	10,458	16,791
Grand Total	**24,899**	**18,898**	**130,017**	**173,814**

Data Source: Model output data – TFL
[1/] Type A removes up to 11 thousand board feet/acre.
[2/] Type B removes 11-20 thousand board feet/acre.
[3/] Type C removes more than 20 thousand board feet /acre.

Table D-5a. Percent of Riparian Area in which Timber Harvest Activities Would Occur per Decade under Alternative 1, by HCP Planning Unit

HCP Planning Unit (Riparian Acres)	Decade	Percent of Riparian Area Harvested - Alternative 1			
		Harvest Type			
		A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013			2.3%	2.3%
(86,443 acres)	2014-2023			2.7%	2.7%
	2024-2033			3.5%	3.5%
	2034-2043			2.4%	2.4%
	2044-2053			2.1%	2.1%
	2054-2063			3.7%	3.7%
	2064-2067			1.4%	1.4%
	Mean 2004-2067			2.8%	2.8%
N. PUGET	2004-2013			1.7%	1.7%
(92,724 acres)	2014-2023			2.3%	2.3%
	2024-2033			2.5%	2.5%
	2034-2043			1.9%	1.9%
	2044-2053			2.0%	2.0%
	2054-2063			1.6%	1.6%
	2064-2067			0.4%	0.4%
	Mean 2004-2067			2.0%	2.0%
OESF	2004-2013			1.2%	1.2%
(111,308 acres)	2014-2023			1.3%	1.3%
	2024-2033			1.8%	1.8%
	2034-2043			1.5%	1.5%
	2044-2053			1.2%	1.2%
	2054-2063			1.5%	1.5%
	2064-2067			0.6%	0.6%
	Mean 2004-2067			1.4%	1.4%
S. COAST	2004-2013			1.8%	1.8%
(80,966 acres)	2014-2023			3.1%	3.1%
	2024-2033			3.8%	3.8%
	2034-2043			2.6%	2.6%
	2044-2053			2.8%	2.8%
	2054-2063			2.0%	2.0%
	2064-2067			0.6%	0.6%
	Mean 2004-2067			2.6%	2.6%
S. PUGET	2004-2013			1.1%	1.1%
(34,606 acres)	2014-2023			2.4%	2.4%
	2024-2033			2.7%	2.7%
	2034-2043			2.8%	2.8%
	2044-2053			2.6%	2.6%
	2054-2063			2.6%	2.6%
	2064-2067			1.3%	1.3%
	Mean 2004-2067			2.4%	2.4%
STRAITS	2004-2013			1.0%	1.0%
(20,684 acres)	2014-2023			0.8%	0.8%
	2024-2033			2.0%	2.0%
	2034-2043			1.8%	1.8%
	2044-2053			1.3%	1.3%
	2054-2063			1.9%	1.9%
	2064-2067			0.7%	0.7%
	Mean 2004-2067			1.5%	1.5%
Total	2004-2013			1.7%	1.7%
(426,731 acres)	2014-2023			2.2%	2.2%
	2024-2033			2.8%	2.8%
	2034-2043			2.1%	2.1%
	2044-2053			2.0%	2.0%
	2054-2063			2.2%	2.2%
	2064-2067			0.8%	0.8%
	Mean 2004-2067			2.1%	2.1%

OESF = Olympic Experimental State Forest

Table D-5b. Percent of Riparian Area in which Timber Harvest Activities Would Occur per Decade under Alternative 2, by HCP Planning Unit

HCP Planning Unit (Riparian Acres)	Decade	Percent of Riparian Area Harvested - Alternative 2 Harvest Type A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	1.7%	0.2%	1.8%	3.7%
(86,443 acres)	2014-2023	2.7%	0.2%	1.8%	4.6%
	2024-2033	2.2%	0.2%	2.9%	5.3%
	2034-2043	0.3%	0.2%	3.8%	4.3%
	2044-2053	0.2%	0.2%	4.2%	4.5%
	2054-2063	0.8%	0.2%	3.1%	4.1%
	2064-2067	0.2%	0.1%	0.8%	1.1%
	Mean 2004-2067	1.2%	0.2%	2.9%	4.3%
N. PUGET	2004-2013	1.0%	0.2%	1.8%	3.0%
(92,724 acres)	2014-2023	2.0%	0.1%	1.7%	3.8%
	2024-2033	2.0%	0.0%	2.2%	4.3%
	2034-2043	0.5%	0.1%	2.5%	3.1%
	2044-2053	0.7%	0.6%	3.1%	4.3%
	2054-2063	0.4%	0.1%	3.3%	3.7%
	2064-2067	0.2%	0.1%	0.8%	1.1%
	Mean 2004-2067	1.1%	0.2%	2.4%	3.7%
OESF	2004-2013	1.3%	0.1%	1.8%	3.3%
(111,308 acres)	2014-2023	1.6%	0.2%	2.2%	4.0%
	2024-2033	0.9%	0.2%	3.8%	4.9%
	2034-2043	0.4%	0.2%	5.4%	5.9%
	2044-2053	0.3%	0.1%	4.8%	5.2%
	2054-2063	0.4%	0.1%	5.7%	6.2%
	2064-2067	0.2%	0.0%	1.9%	2.1%
	Mean 2004-2067	0.8%	0.1%	4.0%	4.9%
S. COAST	2004-2013	1.6%	0.4%	2.4%	4.4%
(80,966 acres)	2014-2023	3.0%	0.1%	1.8%	4.9%
	2024-2033	2.9%	0.1%	3.3%	6.3%
	2034-2043	0.8%	0.2%	4.5%	5.5%
	2044-2053	0.9%	0.7%	4.0%	5.5%
	2054-2063	0.4%	0.5%	4.4%	5.3%
	2064-2067	0.1%	0.1%	1.1%	1.4%
	Mean 2004-2067	1.5%	0.3%	3.4%	5.2%
S. PUGET	2004-2013	0.5%	0.2%	1.3%	1.9%
(34,606 acres)	2014-2023	1.6%	0.2%	1.2%	3.1%
	2024-2033	1.9%	0.1%	1.5%	3.5%
	2034-2043	0.5%	0.1%	2.8%	3.4%
	2044-2053	0.4%	0.4%	2.9%	3.6%
	2054-2063	1.1%	0.5%	1.8%	3.5%
	2064-2067	0.2%	0.1%	0.7%	1.0%
	Mean 2004-2067	1.0%	0.3%	1.9%	3.1%
STRAITS	2004-2013	0.4%	0.6%	1.5%	2.5%
(20,684 acres)	2014-2023	0.7%	0.1%	2.2%	3.0%
	2024-2033	2.1%	0.4%	1.9%	4.4%
	2034-2043	1.6%	0.3%	2.2%	4.1%
	2044-2053	1.1%	0.5%	2.9%	4.5%
	2054-2063	2.5%	2.2%	3.1%	7.9%
	2064-2067	0.9%	0.4%	1.0%	2.3%
	Mean 2004-2067	1.4%	0.7%	2.3%	4.5%
Total	2004-2013	1.3%	0.2%	1.9%	3.4%
(426,731 acres)	2014-2023	2.1%	0.2%	1.8%	4.1%
	2024-2033	1.9%	0.2%	2.9%	5.0%
	2034-2043	0.6%	0.2%	3.9%	4.6%
	2044-2053	0.5%	0.4%	3.9%	4.8%
	2054-2063	0.6%	0.3%	4.0%	4.9%
	2064-2067	0.2%	0.1%	1.2%	1.5%
	Mean 2004-2067	1.1%	0.2%	3.1%	4.4%

OESF = Olympic Experimental State Forest

Table D-5c. Percent of Riparian Area in which Timber Harvest Activities Would Occur per Decade under Alternative 3, by HCP Planning Unit

HCP Planning Unit (Riparian Acres)	Decade	Percent of Riparian Area Harvested - Alternative 3 Harvest Type A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	2.2%	0.1%	2.7%	5.0%
(86,443 acres)	2014-2023	3.2%	0.2%	2.1%	5.5%
	2024-2033	2.7%	0.2%	2.9%	5.8%
	2034-2043	0.5%	0.2%	4.4%	5.1%
	2044-2053	0.3%	0.3%	4.9%	5.4%
	2054-2063	0.8%	0.2%	3.6%	4.6%
	2064-2067	0.2%	0.1%	1.1%	1.4%
	Mean 2004-2067	1.6%	0.2%	3.4%	5.2%
N. PUGET	2004-2013	0.7%	0.1%	1.4%	2.2%
(92,724 acres)	2014-2023	2.3%	0.1%	2.5%	4.9%
	2024-2033	2.9%	0.1%	2.0%	4.9%
	2034-2043	0.9%	0.1%	3.1%	4.1%
	2044-2053	0.4%	0.2%	4.6%	5.1%
	2054-2063	0.6%	0.1%	2.6%	3.3%
	2064-2067	0.1%	0.0%	0.9%	1.1%
	Mean 2004-2067	1.2%	0.1%	2.7%	4.0%
OESF	2004-2013	0.4%	0.1%	1.2%	1.8%
(111,308 acres)	2014-2023	0.6%	0.2%	1.1%	1.9%
	2024-2033	0.8%	0.2%	3.7%	4.7%
	2034-2043	0.5%	0.3%	4.6%	5.3%
	2044-2053	0.5%	0.2%	8.2%	8.9%
	2054-2063	0.2%	0.2%	6.5%	6.9%
	2064-2067	0.1%	0.1%	3.9%	4.1%
	Mean 2004-2067	0.5%	0.2%	4.6%	5.3%
S. COAST	2004-2013	1.6%	0.1%	2.6%	4.4%
(80,966 acres)	2014-2023	4.7%	0.1%	2.8%	7.6%
	2024-2033	3.8%	0.0%	3.0%	6.9%
	2034-2043	0.6%	0.1%	5.6%	6.3%
	2044-2053	0.3%	0.1%	5.6%	6.0%
	2054-2063	0.2%	0.2%	2.9%	3.3%
	2064-2067	0.0%	0.0%	1.4%	1.4%
	Mean 2004-2067	1.8%	0.1%	3.7%	5.6%
S. PUGET	2004-2013	0.2%	0.0%	1.8%	2.1%
(34,606 acres)	2014-2023	1.5%	0.1%	1.2%	2.7%
	2024-2033	1.8%	0.2%	1.4%	3.3%
	2034-2043	0.6%	0.1%	3.1%	3.8%
	2044-2053	0.4%	0.1%	2.9%	3.5%
	2054-2063	0.5%	0.2%	2.3%	3.0%
	2064-2067	0.2%	0.0%	1.5%	1.7%
	Mean 2004-2067	0.8%	0.1%	2.2%	3.1%
STRAITS	2004-2013	0.7%	0.3%	3.6%	4.5%
(20,684 acres)	2014-2023	2.2%	0.1%	2.3%	4.7%
	2024-2033	3.3%	0.2%	1.4%	4.8%
	2034-2043	1.0%	0.4%	3.7%	5.1%
	2044-2053	0.5%	0.3%	5.4%	6.3%
	2054-2063	0.4%	0.1%	3.1%	3.6%
	2064-2067	0.1%	0.0%	1.1%	1.3%
	Mean 2004-2067	1.3%	0.2%	3.2%	4.7%
Total	2004-2013	1.1%	0.1%	2.0%	3.2%
(426,731 acres)	2014-2023	2.4%	0.1%	2.0%	4.6%
	2024-2033	2.4%	0.1%	2.7%	5.3%
	2034-2043	0.6%	0.2%	4.2%	5.1%
	2044-2053	0.4%	0.2%	5.7%	6.2%
	2054-2063	0.4%	0.2%	3.9%	4.5%
	2064-2067	0.1%	0.1%	1.9%	2.1%
	Mean 2004-2067	1.2%	0.2%	3.5%	4.8%

OESF = Olympic Experimental State Forest

Table D-5d. Percent of Riparian Area in which Timber Harvest Activities Would Occur per Decade under Alternative 4, by HCP Planning Unit

HCP Planning Unit (Riparian Acres)	Decade	Percent of Riparian Area Harvested - Alternative 4 Harvest Type A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013			5.0%	5.0%
(86,443 acres)	2014-2023			4.6%	4.6%
	2024-2033			5.7%	5.7%
	2034-2043			5.9%	5.9%
	2044-2053			6.5%	6.5%
	2054-2063			8.0%	8.0%
	2064-2067			2.9%	2.9%
	Mean 2004-2067			6.0%	6.0%
N. PUGET	2004-2013			3.6%	3.6%
(92,724 acres)	2014-2023			3.1%	3.1%
	2024-2033			4.3%	4.3%
	2034-2043			5.7%	5.7%
	2044-2053			6.5%	6.5%
	2054-2063			7.2%	7.2%
	2064-2067			2.5%	2.5%
	Mean 2004-2067			5.2%	5.2%
OESF	2004-2013			1.2%	1.2%
(111,308 acres)	2014-2023			1.3%	1.3%
	2024-2033			1.5%	1.5%
	2034-2043			1.6%	1.6%
	2044-2053			1.5%	1.5%
	2054-2063			1.5%	1.5%
	2064-2067			0.7%	0.7%
	Mean 2004-2067			1.4%	1.4%
S. COAST	2004-2013			5.8%	5.8%
(80,966 acres)	2014-2023			6.3%	6.3%
	2024-2033			6.6%	6.6%
	2034-2043			7.0%	7.0%
	2044-2053			8.0%	8.0%
	2054-2063			10.5%	10.5%
	2064-2067			4.1%	4.1%
	Mean 2004-2067			7.5%	7.5%
S. PUGET	2004-2013			2.4%	2.4%
(34,606 acres)	2014-2023			2.8%	2.8%
	2024-2033			3.4%	3.4%
	2034-2043			3.5%	3.5%
	2044-2053			3.6%	3.6%
	2054-2063			3.9%	3.9%
	2064-2067			1.9%	1.9%
	Mean 2004-2067			3.4%	3.4%
STRAITS	2004-2013			3.9%	3.9%
(20,684 acres)	2014-2023			3.5%	3.5%
	2024-2033			6.0%	6.0%
	2034-2043			7.4%	7.4%
	2044-2053			7.7%	7.7%
	2054-2063			7.6%	7.6%
	2064-2067			3.4%	3.4%
	Mean 2004-2067			6.2%	6.2%
Total	2004-2013			3.6%	3.6%
(426,731 acres)	2014-2023			3.5%	3.5%
	2024-2033			4.3%	4.3%
	2034-2043			4.8%	4.8%
	2044-2053			5.3%	5.3%
	2054-2063			6.2%	6.2%
	2064-2067			2.4%	2.4%
	Mean 2004-2067			4.7%	4.7%

OESF = Olympic Experimental State Forest

Table D-5e. Percent of Riparian Area in which Timber Harvest Activities Would Occur per Decade under Alternative 5, by HCP Planning Unit

HCP Planning Unit (Riparian Acres)	Decade	Percent of Riparian Area Harvested - Alternative 5 Harvest Type A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	4.9%	0.6%	2.1%	7.7%
(86,443 acres)	2014-2023	6.4%	0.3%	2.1%	8.8%
	2024-2033	9.1%	0.3%	3.5%	12.9%
	2034-2043	4.0%	0.2%	2.6%	6.8%
	2044-2053	1.9%	0.1%	3.1%	5.1%
	2054-2063	1.1%	0.4%	3.2%	4.7%
	2064-2067	0.4%	0.1%	1.0%	1.5%
	Mean 2004-2067	4.3%	0.3%	2.8%	7.4%
N. PUGET	2004-2013	1.7%	0.1%	1.7%	3.5%
(92,724 acres)	2014-2023	4.3%	0.1%	2.1%	6.4%
	2024-2033	5.9%	0.2%	3.0%	9.1%
	2034-2043	2.0%	0.1%	2.1%	4.2%
	2044-2053	1.0%	0.1%	2.9%	4.1%
	2054-2063	0.4%	0.3%	2.2%	2.9%
	2064-2067	0.0%	0.0%	0.7%	0.7%
	Mean 2004-2067	2.4%	0.2%	2.3%	4.8%
OESF	2004-2013	5.7%	0.1%	1.8%	7.7%
(111,308 acres)	2014-2023	10.3%	0.2%	1.5%	12.0%
	2024-2033	11.8%	0.4%	2.4%	14.6%
	2034-2043	8.1%	1.0%	3.6%	12.6%
	2044-2053	3.4%	0.1%	3.4%	7.0%
	2054-2063	0.4%	0.1%	2.7%	3.1%
	2064-2067	0.0%	0.0%	0.6%	0.6%
	Mean 2004-2067	6.2%	0.3%	2.5%	9.0%
S. COAST	2004-2013	3.1%	0.7%	2.1%	5.9%
(80,966 acres)	2014-2023	7.7%	0.3%	2.2%	10.2%
	2024-2033	7.4%	0.4%	3.9%	11.7%
	2034-2043	2.4%	0.4%	2.4%	5.2%
	2044-2053	2.1%	0.3%	2.9%	5.3%
	2054-2063	2.7%	0.7%	3.3%	6.6%
	2064-2067	0.6%	0.1%	0.8%	1.5%
	Mean 2004-2067	4.1%	0.4%	2.8%	7.3%
S. PUGET	2004-2013	3.0%	0.7%	1.9%	5.6%
(34,606 acres)	2014-2023	5.8%	0.2%	1.7%	7.6%
	2024-2033	8.4%	0.7%	2.9%	12.0%
	2034-2043	3.3%	0.4%	2.4%	6.1%
	2044-2053	2.6%	0.3%	2.5%	5.4%
	2054-2063	2.3%	0.6%	2.4%	5.3%
	2064-2067	1.3%	0.2%	0.9%	2.4%
	Mean 2004-2067	4.2%	0.5%	2.3%	7.0%
STRAITS	2004-2013	3.1%	0.8%	2.8%	6.6%
(20,684 acres)	2014-2023	4.9%	0.2%	1.9%	7.0%
	2024-2033	7.8%	0.4%	3.1%	11.3%
	2034-2043	3.6%	0.4%	2.7%	6.8%
	2044-2053	3.0%	0.8%	1.8%	5.5%
	2054-2063	3.3%	0.4%	3.4%	7.1%
	2064-2067	1.3%	0.1%	1.0%	2.5%
	Mean 2004-2067	4.2%	0.5%	2.6%	7.3%
Total	2004-2013	3.8%	0.4%	2.0%	6.2%
(426,731 acres)	2014-2023	7.1%	0.2%	1.9%	9.2%
	2024-2033	8.7%	0.3%	3.1%	12.1%
	2034-2043	4.2%	0.5%	2.7%	7.4%
	2044-2053	2.3%	0.2%	3.0%	5.4%
	2054-2063	1.3%	0.4%	2.8%	4.4%
	2064-2067	0.4%	0.1%	0.8%	1.2%
	Mean 2004-2067	4.3%	0.3%	2.5%	7.2%

OESF = Olympic Experimental State Forest

Table D-5f. Percent of Riparian Area in which Timber Harvest Activities Would Occur per Decade under the Preferred Alternative, by HCP Planning Unit

HCP Planning Unit (Riparian Acres)	Decade	Percent of Riparian Area Harvested - Preferred Alternative: Harvest Type A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	0.3%	0.9%	3.2%	4.4%
(86,443 acres)	2014-2023	1.3%	2.6%	11.9%	15.8%
	2024-2033	1.1%	1.7%	4.2%	7.0%
	2034-2043	0.1%	1.5%	4.8%	6.4%
	2044-2053	0.2%	1.8%	8.1%	10.1%
	2054-2063	0.5%	1.9%	5.9%	8.3%
	2064-2067	1.4%	0.7%	2.8%	4.9%
	Mean 2004-2067	0.8%	1.8%	6.4%	8.9%
N. PUGET	2004-2013	0.2%	0.3%	4.1%	4.5%
(92,724 acres)	2014-2023	0.6%	0.9%	6.3%	7.7%
	2024-2033	0.7%	0.7%	4.1%	5.5%
	2034-2043	0.1%	1.6%	3.1%	4.8%
	2044-2053	0.1%	2.2%	5.1%	7.4%
	2054-2063	0.4%	2.5%	4.2%	7.1%
	2064-2067	0.5%	0.9%	1.3%	2.7%
	Mean 2004-2067	0.4%	1.4%	4.4%	6.2%
OESF	2004-2013	0.2%	0.3%	4.1%	4.6%
(111,308 acres)	2014-2023	0.7%	0.3%	2.4%	3.5%
	2024-2033	0.6%	0.3%	4.7%	5.6%
	2034-2043	0.0%	0.6%	4.3%	4.9%
	2044-2053	0.0%	0.1%	6.1%	6.2%
	2054-2063	0.1%	0.2%	8.0%	8.3%
	2064-2067	0.6%	0.1%	1.8%	2.5%
	Mean 2004-2067	0.4%	0.3%	4.9%	5.6%
S. COAST	2004-2013	0.2%	0.4%	4.3%	4.8%
(80,966 acres)	2014-2023	0.6%	1.2%	12.4%	14.2%
	2024-2033	2.2%	2.2%	6.8%	11.2%
	2034-2043	0.4%	2.9%	8.5%	11.7%
	2044-2053	0.1%	5.1%	6.8%	11.9%
	2054-2063	0.4%	3.4%	6.4%	10.3%
	2064-2067	0.7%	2.2%	3.1%	6.0%
	Mean 2004-2067	0.7%	2.7%	7.5%	10.9%
S. PUGET	2004-2013	0.3%	0.5%	2.3%	3.1%
(34,606 acres)	2014-2023	1.4%	1.3%	7.0%	9.7%
	2024-2033	1.2%	0.7%	2.9%	4.8%
	2034-2043	0.2%	1.6%	3.0%	4.9%
	2044-2053	0.2%	2.1%	4.8%	7.1%
	2054-2063	0.2%	2.2%	3.1%	5.6%
	2064-2067	0.8%	0.8%	1.6%	3.1%
	Mean 2004-2067	0.7%	1.4%	3.9%	6.0%
STRAITS	2004-2013	0.8%	1.3%	3.2%	5.2%
(20,684 acres)	2014-2023	2.7%	4.1%	13.0%	19.8%
	2024-2033	1.6%	2.4%	6.6%	10.6%
	2034-2043	0.9%	4.0%	2.9%	7.9%
	2044-2053	0.4%	5.5%	5.0%	10.9%
	2054-2063	0.6%	4.8%	2.8%	8.2%
	2064-2067	0.7%	2.8%	1.6%	5.1%
	Mean 2004-2067	1.2%	3.9%	5.5%	10.6%
Total	2004-2013	0.2%	0.5%	3.7%	4.5%
(426,731 acres)	2014-2023	0.9%	1.3%	8.0%	10.2%
	2024-2033	1.1%	1.2%	4.8%	7.1%
	2034-2043	0.2%	1.7%	4.7%	6.6%
	2044-2053	0.1%	2.3%	6.3%	8.6%
	2054-2063	0.3%	2.1%	5.8%	8.2%
	2064-2067	0.8%	1.0%	2.1%	3.9%
	Mean 2004-2067	0.6%	1.6%	5.5%	7.7%

OESF = Olympic Experimental State Forest

Table D-6a. Percent of the Upland Areas with General Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 1, by HCP Planning Unit

HCP Planning Unit		Upland Areas with General Management Objectives Alternative 1			
		Harvest Type			
(General Acres)	Decade	A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	9.6%	0.9%	20.0%	30.5%
(81,625 acres)	2014-2023	13.4%	1.2%	15.9%	30.5%
	2024-2033	11.4%	0.4%	15.0%	26.8%
	2034-2043	7.8%	1.6%	15.1%	24.5%
	2044-2053	7.1%	0.9%	15.7%	23.7%
	2054-2063	10.5%	1.6%	13.1%	25.2%
	2064-2067	6.1%	1.6%	6.0%	13.7%
	Mean 2004-2067	10.3%	1.3%	15.8%	27.3%
N. PUGET	2004-2013	8.0%	1.7%	18.1%	27.8%
(83,817 acres)	2014-2023	15.2%	2.1%	14.6%	31.9%
	2024-2033	13.5%	1.1%	9.3%	23.8%
	2034-2043	10.6%	0.3%	13.5%	24.4%
	2044-2053	19.0%	0.9%	15.5%	35.4%
	2054-2063	10.8%	1.9%	13.8%	26.5%
	2064-2067	3.6%	1.4%	5.8%	10.9%
	Mean 2004-2067	12.6%	1.5%	14.1%	28.2%
OESF	2004-2013				
(0 acres)	2014-2023				
	2024-2033				
	2034-2043				
	2044-2053				
	2054-2063				
	2064-2067				
	Mean 2004-2067				
S. COAST	2004-2013	4.7%	1.0%	14.4%	20.1%
(115,307 acres)	2014-2023	15.4%	2.1%	12.1%	29.5%
	2024-2033	9.8%	0.3%	11.7%	21.8%
	2034-2043	5.9%	0.2%	15.0%	21.2%
	2044-2053	5.3%	2.0%	15.2%	22.5%
	2054-2063	8.6%	1.3%	13.8%	23.7%
	2064-2067	4.0%	0.6%	6.4%	11.0%
	Mean 2004-2067	8.4%	1.2%	13.8%	23.4%
S. PUGET	2004-2013	6.7%	3.3%	21.5%	31.4%
(25,183 acres)	2014-2023	9.6%	2.4%	11.4%	23.4%
	2024-2033	13.3%	2.3%	7.5%	23.1%
	2034-2043	15.4%	4.0%	6.0%	25.4%
	2044-2053	9.3%	1.9%	9.3%	20.4%
	2054-2063	7.5%	1.2%	9.2%	17.8%
	2064-2067	1.7%	1.1%	4.0%	6.8%
	Mean 2004-2067	9.9%	2.5%	10.8%	23.2%
STRAITS	2004-2013	2.5%	2.7%	12.7%	17.9%
(56,774 acres)	2014-2023	3.2%	0.9%	7.7%	11.7%
	2024-2033	8.0%	0.9%	6.9%	15.8%
	2034-2043	5.9%	1.4%	5.3%	12.6%
	2044-2053	4.9%	1.3%	6.1%	12.3%
	2054-2063	3.9%	1.8%	7.2%	12.9%
	2064-2067	1.8%	0.7%	3.0%	5.4%
	Mean 2004-2067	4.7%	1.5%	7.6%	13.9%
Total	2004-2013	6.4%	1.6%	16.7%	24.7%
(362,706 acres)	2014-2023	12.6%	1.7%	12.8%	27.1%
	2024-2033	11.0%	0.7%	10.9%	22.5%
	2034-2043	8.1%	1.0%	12.5%	21.6%
	2044-2053	9.1%	1.4%	13.5%	24.0%
	2054-2063	8.7%	1.6%	12.3%	22.6%
	2064-2067	3.9%	1.0%	5.5%	10.4%
	Mean 2004-2067	9.3%	1.4%	13.2%	23.9%

OESF = Olympic Experimental State Forest

Table D-6b. Percent of the Upland Areas with General Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 2, by HCP Planning Unit

HCP Planning Unit		Upland Areas with General Management Objectives Alternative 2			
		Harvest Type			
(General Acres)	Decade	A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	5.5%	3.3%	16.7%	25.5%
(81,625 acres)	2014-2023	10.1%	1.8%	17.6%	29.5%
	2024-2033	7.7%	2.0%	12.6%	22.3%
	2034-2043	5.4%	1.4%	16.0%	22.9%
	2044-2053	5.0%	0.9%	16.7%	22.6%
	2054-2063	4.6%	0.9%	16.7%	22.2%
	2064-2067	3.9%	1.0%	7.9%	12.8%
	Mean 2004-2067	6.6%	1.8%	16.3%	24.6%
N. PUGET	2004-2013	7.5%	2.1%	15.3%	25.0%
(83,817 acres)	2014-2023	11.4%	1.2%	13.4%	26.0%
	2024-2033	8.8%	1.2%	9.7%	19.7%
	2034-2043	9.0%	0.6%	14.9%	24.5%
	2044-2053	8.9%	1.2%	17.9%	28.0%
	2054-2063	10.3%	3.6%	17.8%	31.7%
	2064-2067	5.1%	1.7%	5.5%	12.2%
	Mean 2004-2067	9.5%	1.8%	14.8%	26.1%
OESF	2004-2013				
(0 acres)	2014-2023				
	2024-2033				
	2034-2043				
	2044-2053				
	2054-2063				
	2064-2067				
	Mean 2004-2067				
S. COAST	2004-2013	6.4%	4.3%	16.9%	27.6%
(115,307 acres)	2014-2023	11.0%	1.9%	14.9%	27.8%
	2024-2033	8.3%	1.6%	13.4%	23.2%
	2034-2043	7.2%	1.7%	18.4%	27.4%
	2044-2053	5.1%	3.4%	19.4%	27.9%
	2054-2063	5.3%	4.0%	16.8%	26.1%
	2064-2067	2.2%	1.0%	6.6%	9.8%
	Mean 2004-2067	7.1%	2.8%	16.6%	26.5%
S. PUGET	2004-2013	5.6%	4.0%	17.3%	26.9%
(25,183 acres)	2014-2023	6.3%	2.4%	14.9%	23.6%
	2024-2033	9.5%	2.6%	8.9%	21.1%
	2034-2043	8.0%	3.3%	6.9%	18.2%
	2044-2053	5.9%	1.1%	12.4%	19.4%
	2054-2063	3.0%	1.7%	12.1%	16.8%
	2064-2067	0.7%	0.3%	8.9%	9.9%
	Mean 2004-2067	6.1%	2.4%	12.7%	21.2%
STRAITS	2004-2013	3.0%	4.1%	12.7%	19.8%
(56,774 acres)	2014-2023	4.6%	1.7%	16.0%	22.3%
	2024-2033	8.6%	2.3%	9.7%	20.6%
	2034-2043	5.6%	2.4%	8.2%	16.1%
	2044-2053	6.5%	2.7%	12.8%	22.0%
	2054-2063	3.6%	4.3%	15.0%	22.9%
	2064-2067	0.7%	0.5%	5.9%	7.1%
	Mean 2004-2067	5.1%	2.8%	12.5%	20.4%
Total	2004-2013	5.9%	3.5%	15.9%	25.2%
(362,706 acres)	2014-2023	9.6%	1.7%	15.3%	26.6%
	2024-2033	8.4%	1.8%	11.5%	21.7%
	2034-2043	7.0%	1.6%	14.7%	23.3%
	2044-2053	6.2%	2.1%	16.9%	25.2%
	2054-2063	5.9%	3.1%	16.4%	25.4%
	2064-2067	2.9%	1.0%	6.7%	10.6%
	Mean 2004-2067	7.2%	2.3%	15.2%	24.7%

OESF = Olympic Experimental State Forest

Table D-6c. Percent of the Upland Areas with General Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 3, by HCP Planning Unit

		Upland Areas with General Management Objectives Alternative 3			
HCP Planning Unit		**Harvest Type**			
(General Acres)	**Decade**	**A (Area Net)**	**B (Area Gross)**	**C (Area Gross)**	**Total**
COLUMBIA	2004-2013	11.3%	0.8%	25.6%	37.7%
(81,625 acres)	2014-2023	15.6%	0.9%	21.5%	38.0%
	2024-2033	12.2%	0.3%	13.3%	25.8%
	2034-2043	9.2%	0.1%	12.7%	22.0%
	2044-2053	11.9%	0.3%	17.6%	29.8%
	2054-2063	14.9%	2.6%	20.3%	37.8%
	2064-2067	6.7%	2.5%	8.3%	17.5%
	Mean 2004-2067	12.8%	1.2%	18.6%	32.6%
N. PUGET	2004-2013	3.8%	0.7%	11.3%	15.8%
(83,817 acres)	2014-2023	14.6%	1.9%	25.5%	42.0%
	2024-2033	16.0%	1.1%	9.3%	26.4%
	2034-2043	9.2%	0.3%	11.7%	21.2%
	2044-2053	14.7%	0.8%	15.5%	31.0%
	2054-2063	26.5%	2.0%	17.2%	45.7%
	2064-2067	5.5%	2.1%	5.5%	13.0%
	Mean 2004-2067	14.1%	1.4%	15.0%	30.5%
OESF	2004-2013				
(0 acres)	2014-2023				
	2024-2033				
	2034-2043				
	2044-2053				
	2054-2063				
	2064-2067				
	Mean 2004-2067				
S. COAST	2004-2013	5.2%	0.8%	21.6%	27.5%
(115,307 acres)	2014-2023	18.7%	1.4%	21.1%	41.2%
	2024-2033	12.2%	0.4%	10.7%	23.3%
	2034-2043	10.2%	0.2%	16.6%	26.9%
	2044-2053	10.7%	0.1%	19.0%	29.9%
	2054-2063	15.7%	1.3%	21.9%	39.0%
	2064-2067	3.0%	2.6%	7.3%	12.9%
	Mean 2004-2067	11.8%	1.1%	18.5%	31.4%
S. PUGET	2004-2013	3.3%	1.5%	38.1%	42.9%
(25,183 acres)	2014-2023	7.8%	0.4%	7.9%	16.0%
	2024-2033	12.5%	1.1%	3.0%	16.6%
	2034-2043	9.1%	1.3%	7.3%	17.7%
	2044-2053	12.6%	0.5%	9.9%	23.0%
	2054-2063	6.5%	1.4%	13.9%	21.8%
	2064-2067	1.7%	0.1%	15.7%	17.5%
	Mean 2004-2067	8.3%	1.0%	15.0%	24.3%
STRAITS	2004-2013	5.2%	2.5%	33.8%	41.5%
(56,774 acres)	2014-2023	8.6%	0.9%	14.6%	24.1%
	2024-2033	12.8%	0.9%	4.2%	17.8%
	2034-2043	7.1%	0.2%	6.9%	14.2%
	2044-2053	13.2%	0.6%	15.6%	29.4%
	2054-2063	19.6%	1.3%	15.0%	36.0%
	2064-2067	6.6%	0.8%	9.1%	16.6%
	Mean 2004-2067	11.4%	1.1%	15.5%	28.1%
Total	2004-2013	6.1%	1.1%	23.2%	30.4%
(362,706 acres)	2014-2023	14.7%	1.2%	20.3%	36.2%
	2024-2033	13.2%	0.7%	9.4%	23.3%
	2034-2043	9.2%	0.3%	12.4%	21.9%
	2044-2053	12.4%	0.4%	16.7%	29.6%
	2054-2063	18.0%	1.8%	18.8%	38.6%
	2064-2067	4.9%	2.0%	7.9%	14.8%
	Mean 2004-2067	12.3%	1.2%	17.0%	30.4%

OESF = Olympic Experimental State Forest

Table D-6d. Percent of the Upland Areas with General Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 4, by HCP Planning Unit

HCP Planning Unit		Upland Areas with General Management Objectives Alternative 4			
		Harvest Type			
(General Acres)	Decade	A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	17.9%	11.9%	11.6%	41.4%
(81,625 acres)	2014-2023	18.9%	6.4%	16.2%	41.5%
	2024-2033	16.4%	4.0%	12.0%	32.4%
	2034-2043	6.8%	4.5%	12.1%	23.5%
	2044-2053	9.7%	2.2%	13.8%	25.6%
	2054-2063	8.5%	1.9%	12.3%	22.7%
	2064-2067	2.8%	0.6%	5.9%	9.2%
	Mean 2004-2067	12.7%	4.9%	13.1%	30.7%
N. PUGET	2004-2013	11.2%	4.3%	14.3%	29.9%
(83,817 acres)	2014-2023	16.3%	3.5%	13.4%	33.3%
	2024-2033	15.4%	3.6%	9.6%	28.7%
	2034-2043	11.6%	7.0%	5.9%	24.5%
	2044-2053	17.0%	7.4%	10.9%	35.3%
	2054-2063	14.1%	5.2%	12.0%	31.3%
	2064-2067	3.6%	0.8%	4.8%	9.2%
	Mean 2004-2067	14.0%	5.0%	11.1%	30.0%
OESF	2004-2013				
(0 acres)	2014-2023				
	2024-2033				
	2034-2043				
	2044-2053				
	2054-2063				
	2064-2067				
	Mean 2004-2067				
S. COAST	2004-2013	13.9%	10.3%	11.8%	36.0%
(115,307 acres)	2014-2023	22.4%	5.9%	15.4%	43.8%
	2024-2033	12.2%	4.0%	14.2%	30.4%
	2034-2043	7.0%	6.0%	9.4%	22.3%
	2044-2053	10.1%	6.4%	12.1%	28.6%
	2054-2063	8.5%	2.7%	14.1%	25.3%
	2064-2067	5.1%	0.8%	4.2%	10.2%
	Mean 2004-2067	12.4%	5.6%	12.7%	30.7%
S. PUGET	2004-2013	26.0%	15.0%	5.8%	46.9%
(25,183 acres)	2014-2023	15.9%	8.4%	11.1%	35.4%
	2024-2033	16.9%	3.1%	12.1%	32.1%
	2034-2043	7.4%	3.2%	7.5%	18.1%
	2044-2053	10.8%	3.0%	6.5%	20.3%
	2054-2063	7.5%	4.0%	6.6%	18.1%
	2064-2067	3.2%	0.6%	3.0%	6.8%
	Mean 2004-2067	13.7%	5.8%	8.2%	27.8%
STRAITS	2004-2013	12.0%	10.0%	10.7%	32.7%
(56,774 acres)	2014-2023	9.1%	4.5%	10.8%	24.4%
	2024-2033	16.1%	5.6%	8.9%	30.6%
	2034-2043	11.1%	5.5%	5.8%	22.4%
	2044-2053	9.0%	6.7%	7.5%	23.1%
	2054-2063	9.5%	6.8%	7.2%	23.6%
	2064-2067	2.9%	0.6%	3.1%	6.6%
	Mean 2004-2067	10.9%	6.2%	8.4%	25.5%
Total	2004-2013	14.7%	9.5%	11.7%	36.0%
(362,706 acres)	2014-2023	17.7%	5.4%	14.1%	37.2%
	2024-2033	14.8%	4.1%	11.7%	30.6%
	2034-2043	8.7%	5.6%	8.5%	22.8%
	2044-2053	11.5%	5.5%	11.1%	28.0%
	2054-2063	9.9%	3.8%	11.6%	25.3%
	2064-2067	3.8%	0.7%	4.5%	8.9%
	Mean 2004-2067	12.7%	5.4%	11.4%	29.5%

OESF = Olympic Experimental State Forest

Table D-6e. Percent of the Upland Areas with General Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 5, by HCP Planning Unit

HCP Planning Unit (General Acres)	Decade	Upland Areas with General Management Objectives Alternative 5 Harvest Type A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	10.4%	7.7%	15.1%	33.2%
(81,625 acres)	2014-2023	12.7%	2.5%	20.9%	36.1%
	2024-2033	11.6%	1.9%	14.5%	28.0%
	2034-2043	19.7%	1.9%	12.4%	34.0%
	2044-2053	15.3%	1.0%	14.5%	30.9%
	2054-2063	12.4%	0.7%	18.9%	32.1%
	2064-2067	3.7%	0.4%	7.1%	11.2%
	Mean 2004-2067	13.4%	2.5%	16.1%	32.1%
N. PUGET	2004-2013	8.7%	2.2%	13.4%	24.3%
(83,817 acres)	2014-2023	16.7%	1.1%	23.5%	41.2%
	2024-2033	13.0%	2.0%	15.8%	30.7%
	2034-2043	14.5%	2.0%	15.2%	31.8%
	2044-2053	14.3%	1.6%	12.9%	28.8%
	2054-2063	8.5%	0.2%	15.0%	23.8%
	2064-2067	4.7%	0.1%	6.6%	11.3%
	Mean 2004-2067	12.6%	1.4%	16.0%	30.0%
OESF	2004-2013				
(0 acres)	2014-2023				
	2024-2033				
	2034-2043				
	2044-2053				
	2054-2063				
	2064-2067				
	Mean 2004-2067				
S. COAST	2004-2013	7.2%	9.9%	14.4%	31.4%
(115,307 acres)	2014-2023	16.7%	4.6%	19.9%	41.3%
	2024-2033	12.8%	2.5%	15.2%	30.5%
	2034-2043	15.0%	3.5%	15.6%	34.1%
	2044-2053	13.4%	3.2%	14.7%	31.2%
	2054-2063	10.7%	2.9%	14.4%	28.1%
	2064-2067	4.6%	0.7%	6.1%	11.4%
	Mean 2004-2067	12.6%	4.3%	15.7%	32.5%
S. PUGET	2004-2013	12.0%	8.6%	13.1%	33.8%
(25,183 acres)	2014-2023	11.6%	2.0%	10.7%	24.3%
	2024-2033	13.0%	4.0%	7.8%	24.8%
	2034-2043	19.8%	2.0%	6.8%	28.6%
	2044-2053	15.9%	2.5%	11.6%	30.0%
	2054-2063	15.7%	1.4%	17.0%	34.1%
	2064-2067	1.3%	0.1%	5.7%	7.1%
	Mean 2004-2067	14.0%	3.2%	11.3%	28.5%
STRAITS	2004-2013	15.2%	5.5%	19.2%	39.9%
(56,774 acres)	2014-2023	15.4%	2.0%	13.1%	30.5%
	2024-2033	13.5%	3.4%	10.4%	27.3%
	2034-2043	18.4%	2.8%	9.0%	30.2%
	2044-2053	15.6%	2.6%	14.2%	32.5%
	2054-2063	11.9%	1.8%	17.6%	31.3%
	2064-2067	3.5%	0.1%	5.4%	9.1%
	Mean 2004-2067	14.6%	2.8%	13.9%	31.4%
Total	2004-2013	9.8%	6.8%	15.0%	31.7%
(362,706 acres)	2014-2023	15.2%	2.7%	19.3%	37.2%
	2024-2033	12.7%	2.5%	13.9%	29.1%
	2034-2043	16.8%	2.6%	13.1%	32.5%
	2044-2053	14.6%	2.2%	13.9%	30.7%
	2054-2063	11.1%	1.5%	16.3%	28.9%
	2064-2067	4.0%	0.3%	6.3%	10.7%
	Mean 2004-2067	13.2%	2.9%	15.3%	31.4%

OESF = Olympic Experimental State Forest

Table D-6f. Percent of the Upland Areas with General Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under the Preferred Alternative, by HCP Planning Unit

HCP Planning Unit (General Acres)	Decade	Upland Areas with General Management Objectives Preferred Alternative — Harvest Type A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	3.7%	1.8%	27.8%	33.3%
(81,625 acres)	2014-2023	1.9%	0.3%	16.5%	18.7%
	2024-2033	3.2%	0.3%	11.0%	14.5%
	2034-2043	9.6%	0.4%	9.9%	19.9%
	2044-2053	1.6%	0.1%	13.9%	15.7%
	2054-2063	2.0%	0.0%	20.2%	22.2%
	2064-2067	0.5%	0.0%	5.3%	5.8%
	Mean 2004-2067	3.5%	0.4%	16.4%	20.3%
N. PUGET	2004-2013	3.5%	0.6%	22.2%	26.3%
(83,817 acres)	2014-2023	5.4%	0.8%	15.5%	21.7%
	2024-2033	4.3%	0.4%	12.7%	17.3%
	2034-2043	8.3%	0.4%	12.4%	21.2%
	2044-2053	2.3%	0.5%	11.7%	14.6%
	2054-2063	2.6%	0.1%	13.7%	16.4%
	2064-2067	1.2%	0.0%	5.6%	6.8%
	Mean 2004-2067	4.3%	0.4%	14.7%	19.4%
OESF	2004-2013				
(0 acres)	2014-2023				
	2024-2033				
	2034-2043				
	2044-2053				
	2054-2063				
	2064-2067				
	Mean 2004-2067				
S. COAST	2004-2013	2.3%	0.6%	27.2%	30.2%
(115,307 acres)	2014-2023	1.8%	0.4%	16.4%	18.6%
	2024-2033	2.7%	0.3%	11.2%	14.2%
	2034-2043	9.3%	0.8%	10.8%	20.9%
	2044-2053	1.8%	0.2%	10.9%	12.8%
	2054-2063	1.4%	0.0%	17.5%	19.0%
	2064-2067	0.4%	0.0%	4.1%	4.5%
	Mean 2004-2067	3.1%	0.4%	15.3%	18.8%
S. PUGET	2004-2013	2.2%	2.4%	12.2%	16.7%
(25,183 acres)	2014-2023	1.1%	1.2%	13.6%	16.0%
	2024-2033	2.7%	0.7%	7.1%	10.5%
	2034-2043	15.3%	1.0%	3.0%	19.3%
	2044-2053	2.9%	0.7%	6.4%	10.1%
	2054-2063	3.5%	0.0%	15.9%	19.4%
	2064-2067	0.5%	0.0%	2.1%	2.6%
	Mean 2004-2067	4.4%	1.0%	9.4%	14.8%
STRAITS	2004-2013	3.0%	2.3%	18.9%	24.2%
(56,774 acres)	2014-2023	2.1%	0.8%	16.0%	18.9%
	2024-2033	3.1%	0.9%	6.7%	10.7%
	2034-2043	14.3%	0.4%	7.7%	22.4%
	2044-2053	6.8%	0.5%	8.3%	15.6%
	2054-2063	3.7%	0.1%	16.7%	20.6%
	2064-2067	0.7%	0.0%	4.0%	4.6%
	Mean 2004-2067	5.3%	0.8%	12.2%	18.3%
Total	2004-2013	3.0%	1.3%	23.8%	28.1%
(362,706 acres)	2014-2023	2.7%	0.6%	16.0%	19.2%
	2024-2033	3.2%	0.4%	10.5%	14.2%
	2034-2043	10.3%	0.6%	9.9%	20.9%
	2044-2053	2.7%	0.3%	11.1%	14.1%
	2054-2063	2.3%	0.1%	17.0%	19.4%
	2064-2067	0.7%	0.0%	4.6%	5.2%
	Mean 2004-2067	3.9%	0.5%	14.5%	18.9%

OESF = Olympic Experimental State Forest

Table D-7a. Percent of the Upland Areas with Specific Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 1, by HCP Planning Unit

HCP Planning Unit (Specific Acres)	Decade	Upland Areas with Specific Management Objectives Alternative 1 — Harvest Type: A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	4.3%	0.3%	6.1%	**10.6%**
(99,462 acres)	2014-2023	2.6%	0.5%	6.4%	**9.6%**
	2024-2033	3.8%	0.3%	7.6%	**11.7%**
	2034-2043	1.9%	0.4%	6.8%	**9.0%**
	2044-2053	2.3%	0.5%	7.5%	**10.4%**
	2054-2063	4.4%	2.8%	7.3%	**14.5%**
	2064-2067	1.2%	0.3%	2.9%	**4.4%**
	Mean 2004-2067	3.2%	0.8%	7.0%	**11.0%**
N. PUGET	2004-2013	2.7%	0.3%	3.8%	**6.7%**
(204,975 acres)	2014-2023	5.4%	0.3%	3.8%	**9.5%**
	2024-2033	3.6%	0.1%	3.7%	**7.5%**
	2034-2043	1.2%	0.2%	4.7%	**6.1%**
	2044-2053	2.5%	0.6%	5.2%	**8.3%**
	2054-2063	1.6%	0.2%	5.7%	**7.4%**
	2064-2067	0.6%	0.2%	2.2%	**3.0%**
	Mean 2004-2067	2.7%	0.3%	4.5%	**7.6%**
OESF	2004-2013	1.2%	0.2%	2.5%	**3.8%**
(145,351 acres)	2014-2023	1.3%	0.2%	2.4%	**3.9%**
	2024-2033	0.5%	0.1%	3.3%	**3.8%**
	2034-2043	0.2%	0.0%	3.7%	**3.9%**
	2044-2053	0.0%	0.0%	4.3%	**4.3%**
	2054-2063	0.0%	0.0%	3.7%	**3.7%**
	2064-2067	0.0%	0.0%	1.2%	**1.2%**
	Mean 2004-2067	0.5%	0.1%	3.3%	**3.8%**
S. COAST	2004-2013	1.3%	0.3%	3.6%	**5.1%**
(36,659 acres)	2014-2023	4.3%	1.5%	4.2%	**10.0%**
	2024-2033	4.8%	0.1%	4.7%	**9.6%**
	2034-2043	0.7%	0.1%	5.5%	**6.3%**
	2044-2053	0.9%	1.5%	6.8%	**9.2%**
	2054-2063	2.0%	1.4%	5.7%	**9.0%**
	2064-2067	1.0%	0.2%	1.6%	**2.8%**
	Mean 2004-2067	2.3%	0.8%	5.0%	**8.1%**
S. PUGET	2004-2013	1.7%	0.4%	7.1%	**9.1%**
(82,055 acres)	2014-2023	6.5%	0.6%	8.5%	**15.5%**
	2024-2033	8.3%	0.5%	10.8%	**19.6%**
	2034-2043	4.7%	0.9%	9.1%	**14.8%**
	2044-2053	5.5%	1.6%	9.6%	**16.7%**
	2054-2063	6.0%	2.1%	7.1%	**15.2%**
	2064-2067	2.8%	1.3%	2.5%	**6.6%**
	Mean 2004-2067	5.5%	1.2%	8.5%	**15.2%**
STRAITS	2004-2013	0.5%	0.2%	2.1%	**2.8%**
(32,764 acres)	2014-2023	1.3%	1.1%	1.6%	**4.0%**
	2024-2033	3.1%	0.1%	1.7%	**4.9%**
	2034-2043	0.9%	0.4%	2.0%	**3.3%**
	2044-2053	0.6%	0.3%	2.4%	**3.3%**
	2054-2063	1.0%	0.2%	2.1%	**3.3%**
	2064-2067	0.5%	0.1%	0.7%	**1.3%**
	Mean 2004-2067	1.2%	0.4%	2.0%	**3.6%**
Total	2004-2013	2.2%	0.3%	4.2%	**6.7%**
(362,706 acres)	2014-2023	3.8%	0.5%	4.4%	**8.7%**
	2024-2033	3.6%	0.2%	5.2%	**8.9%**
	2034-2043	1.5%	0.3%	5.3%	**7.1%**
	2044-2053	2.1%	0.6%	5.9%	**8.6%**
	2054-2063	2.3%	0.9%	5.4%	**8.6%**
	2064-2067	0.9%	0.3%	2.0%	**3.2%**
	Mean 2004-2067	2.6%	0.5%	5.1%	**8.1%**

OESF = Olympic Experimental State Forest

Table D-7b. Percent of the Upland Areas with Specific Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 2, by HCP Planning Unit

HCP Planning Unit (Specific Acres)	Decade	Upland Areas with Specific Management Objectives Alternative 2 — Harvest Type: A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	3.3%	1.2%	11.1%	**15.7%**
(99,462 acres)	2014-2023	3.6%	3.7%	11.7%	**19.0%**
	2024-2033	4.2%	2.2%	11.2%	**17.6%**
	2034-2043	2.5%	1.5%	11.6%	**15.7%**
	2044-2053	3.8%	1.9%	12.5%	**18.1%**
	2054-2063	4.9%	2.2%	11.6%	**18.6%**
	2064-2067	2.4%	0.4%	4.1%	**6.9%**
	Mean 2004-2067	3.9%	2.1%	11.5%	**17.4%**
N. PUGET	2004-2013	3.3%	2.0%	8.0%	**13.3%**
(204,975 acres)	2014-2023	6.9%	1.4%	6.9%	**15.2%**
	2024-2033	4.6%	1.6%	7.2%	**13.4%**
	2034-2043	2.8%	1.2%	9.3%	**13.3%**
	2044-2053	4.5%	2.9%	9.7%	**17.1%**
	2054-2063	5.7%	2.5%	8.5%	**16.8%**
	2064-2067	3.6%	1.1%	4.0%	**8.8%**
	Mean 2004-2067	4.9%	2.0%	8.4%	**15.3%**
OESF	2004-2013	4.0%	0.3%	7.2%	**11.5%**
(145,351 acres)	2014-2023	3.3%	0.5%	6.5%	**10.3%**
	2024-2033	2.1%	0.2%	10.3%	**12.6%**
	2034-2043	0.7%	0.0%	10.2%	**10.9%**
	2044-2053	1.0%	0.1%	12.9%	**13.9%**
	2054-2063	1.9%	0.2%	9.2%	**11.3%**
	2064-2067	1.1%	0.1%	3.0%	**4.2%**
	Mean 2004-2067	2.2%	0.2%	9.3%	**11.7%**
S. COAST	2004-2013	2.7%	6.8%	13.6%	**23.1%**
(36,659 acres)	2014-2023	5.8%	5.0%	12.4%	**23.2%**
	2024-2033	5.6%	3.4%	19.4%	**28.3%**
	2034-2043	3.7%	2.9%	11.9%	**18.5%**
	2044-2053	3.1%	4.9%	16.8%	**24.8%**
	2054-2063	5.4%	4.5%	13.8%	**23.7%**
	2064-2067	2.4%	1.2%	5.7%	**9.2%**
	Mean 2004-2067	4.5%	4.5%	14.6%	**23.6%**
S. PUGET	2004-2013	2.0%	2.9%	8.2%	**13.1%**
(82,055 acres)	2014-2023	6.6%	2.7%	7.5%	**16.8%**
	2024-2033	7.8%	0.9%	10.8%	**19.5%**
	2034-2043	2.6%	1.1%	12.5%	**16.2%**
	2044-2053	3.4%	2.6%	12.7%	**18.8%**
	2054-2063	2.9%	2.5%	12.3%	**17.6%**
	2064-2067	1.4%	0.6%	4.2%	**6.2%**
	Mean 2004-2067	4.2%	2.1%	10.6%	**16.9%**
STRAITS	2004-2013	1.3%	4.0%	9.2%	**14.6%**
(32,764 acres)	2014-2023	2.8%	5.1%	10.4%	**18.3%**
	2024-2033	6.1%	7.1%	7.6%	**20.8%**
	2034-2043	3.1%	4.9%	10.6%	**18.7%**
	2044-2053	5.0%	3.9%	8.4%	**17.3%**
	2054-2063	4.1%	5.5%	7.7%	**17.3%**
	2064-2067	0.7%	1.0%	3.0%	**4.7%**
	Mean 2004-2067	3.6%	4.9%	8.9%	**17.4%**
Total	2004-2013	3.2%	2.0%	8.7%	**13.9%**
(362,706 acres)	2014-2023	5.2%	2.2%	8.2%	**15.5%**
	2024-2033	4.5%	1.7%	9.8%	**16.0%**
	2034-2043	2.3%	1.3%	10.6%	**14.1%**
	2044-2053	3.3%	2.2%	11.7%	**17.2%**
	2054-2063	4.2%	2.2%	10.0%	**16.3%**
	2064-2067	2.3%	0.7%	3.9%	**6.8%**
	Mean 2004-2067	3.9%	1.9%	9.8%	**15.6%**

OESF = Olympic Experimental State Forest

Table D-7c. Percent of the Upland Areas with Specific Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 3, by HCP Planning Unit

HCP Planning Unit		Upland Areas with Specific Management Objectives Alternative 3			
		Harvest Type			
(Specific Acres)	Decade	A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	4.3%	0.7%	16.1%	**21.1%**
(99,462 acres)	2014-2023	5.0%	2.1%	11.1%	**18.3%**
	2024-2033	4.4%	1.9%	11.3%	**17.6%**
	2034-2043	3.0%	1.7%	11.4%	**16.1%**
	2044-2053	4.4%	1.6%	14.5%	**20.5%**
	2054-2063	5.3%	1.3%	10.9%	**17.5%**
	2064-2067	2.5%	0.4%	6.0%	**9.0%**
	Mean 2004-2067	4.5%	1.5%	12.7%	**18.7%**
N. PUGET	2004-2013	1.9%	0.1%	5.5%	**7.5%**
(204,975 acres)	2014-2023	7.2%	0.4%	10.0%	**17.5%**
	2024-2033	7.6%	0.4%	6.5%	**14.6%**
	2034-2043	3.0%	0.6%	9.7%	**13.3%**
	2044-2053	3.3%	0.9%	14.0%	**18.2%**
	2054-2063	5.6%	0.8%	7.3%	**13.7%**
	2064-2067	2.0%	0.5%	2.9%	**5.3%**
	Mean 2004-2067	4.8%	0.6%	8.7%	**14.1%**
OESF	2004-2013	0.8%	0.2%	4.4%	**5.4%**
(145,351 acres)	2014-2023	1.2%	0.5%	4.0%	**5.6%**
	2024-2033	0.9%	0.1%	9.0%	**10.0%**
	2034-2043	1.0%	0.2%	13.4%	**14.6%**
	2044-2053	1.2%	0.1%	24.2%	**25.5%**
	2054-2063	0.8%	0.1%	13.7%	**14.6%**
	2064-2067	0.2%	0.0%	4.9%	**5.2%**
	Mean 2004-2067	1.0%	0.2%	11.5%	**12.6%**
S. COAST	2004-2013	2.1%	0.4%	16.6%	**19.1%**
(36,659 acres)	2014-2023	8.5%	1.0%	13.6%	**23.2%**
	2024-2033	8.0%	0.9%	10.0%	**18.9%**
	2034-2043	1.4%	1.2%	19.9%	**22.5%**
	2044-2053	2.6%	1.2%	18.5%	**22.3%**
	2054-2063	3.1%	0.8%	9.9%	**13.8%**
	2064-2067	2.8%	0.0%	4.3%	**7.1%**
	Mean 2004-2067	4.5%	0.9%	14.5%	**19.8%**
S. PUGET	2004-2013	1.6%	0.2%	9.5%	**11.3%**
(82,055 acres)	2014-2023	4.8%	0.4%	6.8%	**11.9%**
	2024-2033	7.1%	0.6%	7.4%	**15.2%**
	2034-2043	2.5%	0.8%	16.3%	**19.6%**
	2044-2053	2.2%	0.6%	15.7%	**18.4%**
	2054-2063	1.7%	0.7%	9.2%	**11.7%**
	2064-2067	0.9%	0.4%	8.2%	**9.5%**
	Mean 2004-2067	3.2%	0.6%	11.4%	**15.2%**
STRAITS	2004-2013	2.6%	1.1%	20.4%	**24.1%**
(32,764 acres)	2014-2023	4.6%	0.4%	11.1%	**16.1%**
	2024-2033	6.5%	0.8%	3.1%	**10.4%**
	2034-2043	2.5%	1.2%	16.0%	**19.7%**
	2044-2053	1.9%	1.4%	15.1%	**18.5%**
	2054-2063	4.8%	0.7%	7.8%	**13.3%**
	2064-2067	2.9%	0.1%	3.0%	**6.0%**
	Mean 2004-2067	4.0%	0.9%	11.9%	**16.9%**
Total	2004-2013	2.0%	0.3%	9.0%	**11.4%**
(362,706 acres)	2014-2023	5.0%	0.7%	8.6%	**14.3%**
	2024-2033	5.4%	0.7%	8.1%	**14.1%**
	2034-2043	2.3%	0.8%	12.8%	**15.8%**
	2044-2053	2.7%	0.8%	17.1%	**20.6%**
	2054-2063	3.7%	0.7%	9.9%	**14.2%**
	2064-2067	1.6%	0.3%	4.7%	**6.6%**
	Mean 2004-2067	3.5%	0.7%	10.9%	**15.2%**

OESF = Olympic Experimental State Forest

Table D-7d. Percent of the Upland Areas with Specific Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 4, by HCP Planning Unit

HCP Planning Unit		Upland Areas with Specific Management Objectives Alternative 4			
		Harvest Type			
(Specific Acres)	Decade	A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	7.7%	3.8%	3.3%	**14.8%**
(99,462 acres)	2014-2023	5.7%	4.2%	3.7%	**13.7%**
	2024-2033	6.7%	3.6%	6.6%	**16.9%**
	2034-2043	2.7%	3.8%	5.0%	**11.5%**
	2044-2053	3.6%	4.4%	7.0%	**15.0%**
	2054-2063	4.8%	3.8%	6.8%	**15.4%**
	2064-2067	1.7%	1.2%	3.1%	**6.0%**
	Mean 2004-2067	5.1%	3.9%	5.5%	**14.6%**
N. PUGET	2004-2013	7.4%	1.8%	4.2%	**13.3%**
(204,975 acres)	2014-2023	8.0%	1.3%	5.0%	**14.3%**
	2024-2033	6.7%	1.4%	6.1%	**14.1%**
	2034-2043	3.5%	2.7%	5.8%	**12.0%**
	2044-2053	5.1%	3.0%	5.8%	**13.9%**
	2054-2063	6.2%	3.0%	6.3%	**15.4%**
	2064-2067	1.8%	0.7%	3.0%	**5.5%**
	Mean 2004-2067	6.0%	2.2%	5.6%	**13.8%**
OESF	2004-2013	0.7%	0.6%	1.2%	**2.4%**
(145,351 acres)	2014-2023	0.8%	0.7%	0.9%	**2.3%**
	2024-2033	0.5%	0.5%	0.4%	**1.4%**
	2034-2043	0.3%	0.9%	0.4%	**1.6%**
	2044-2053	0.2%	0.7%	1.3%	**2.2%**
	2054-2063	0.1%	0.9%	1.6%	**2.6%**
	2064-2067	0.0%	0.4%	0.4%	**0.8%**
	Mean 2004-2067	0.4%	0.7%	1.0%	**2.1%**
S. COAST	2004-2013	8.5%	6.1%	7.7%	**22.3%**
(36,659 acres)	2014-2023	8.7%	4.7%	7.3%	**20.7%**
	2024-2033	9.6%	3.5%	11.4%	**24.5%**
	2034-2043	5.2%	4.8%	11.9%	**22.0%**
	2044-2053	4.3%	2.8%	9.3%	**16.4%**
	2054-2063	6.5%	3.6%	8.0%	**18.1%**
	2064-2067	2.7%	1.4%	4.3%	**8.3%**
	Mean 2004-2067	7.1%	4.2%	9.4%	**20.7%**
S. PUGET	2004-2013	5.5%	3.0%	3.4%	**11.9%**
(82,055 acres)	2014-2023	5.4%	1.7%	4.2%	**11.4%**
	2024-2033	6.9%	2.0%	4.4%	**13.3%**
	2034-2043	4.4%	4.5%	5.6%	**14.6%**
	2044-2053	4.0%	2.9%	4.9%	**11.9%**
	2054-2063	3.2%	2.6%	6.9%	**12.6%**
	2064-2067	1.2%	0.9%	2.5%	**4.6%**
	Mean 2004-2067	4.8%	2.8%	5.0%	**12.5%**
STRAITS	2004-2013	6.3%	5.2%	5.9%	**17.4%**
(32,764 acres)	2014-2023	7.5%	3.2%	7.6%	**18.3%**
	2024-2033	10.4%	4.6%	5.4%	**20.3%**
	2034-2043	5.7%	3.8%	6.9%	**16.4%**
	2044-2053	8.4%	4.5%	6.3%	**19.2%**
	2054-2063	7.3%	4.1%	5.2%	**16.6%**
	2064-2067	2.8%	1.3%	2.6%	**6.7%**
	Mean 2004-2067	7.6%	4.2%	6.2%	**18.0%**
Total	2004-2013	5.6%	2.4%	3.5%	**11.5%**
(362,706 acres)	2014-2023	5.6%	2.0%	4.0%	**11.5%**
	2024-2033	5.6%	1.9%	4.8%	**12.4%**
	2034-2043	3.0%	2.9%	4.7%	**10.6%**
	2044-2053	3.7%	2.7%	5.0%	**11.4%**
	2054-2063	4.1%	2.6%	5.4%	**12.1%**
	2064-2067	1.4%	0.8%	2.4%	**4.5%**
	Mean 2004-2067	4.5%	2.4%	4.7%	**11.6%**

OESF = Olympic Experimental State Forest

Table D-7e. Percent of the Upland Areas with Specific Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under Alternative 5, by HCP Planning Unit

Unit (Specific Acres)	Decade	Upland Areas with Specific Management Objectives Alternative 5 — Harvest Type: A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	11.3%	6.9%	13.8%	**32.1%**
(99,462 acres)	2014-2023	10.2%	5.5%	11.5%	**27.2%**
	2024-2033	14.6%	4.9%	11.9%	**31.5%**
	2034-2043	17.6%	3.4%	11.3%	**32.3%**
	2044-2053	11.7%	2.4%	10.6%	**24.7%**
	2054-2063	13.2%	3.1%	13.5%	**29.8%**
	2064-2067	3.5%	1.2%	6.8%	**11.5%**
	Mean 2004-2067	12.8%	4.3%	12.4%	**29.6%**
N. PUGET	2004-2013	5.1%	2.4%	6.4%	**13.8%**
(204,975 acres)	2014-2023	9.5%	2.3%	8.6%	**20.4%**
	2024-2033	8.1%	3.0%	9.8%	**21.0%**
	2034-2043	8.8%	2.3%	8.1%	**19.3%**
	2044-2053	7.5%	3.1%	8.4%	**18.9%**
	2054-2063	4.9%	1.2%	7.0%	**13.1%**
	2064-2067	2.3%	0.4%	3.1%	**5.8%**
	Mean 2004-2067	7.2%	2.3%	8.0%	**17.5%**
OESF	2004-2013	14.1%	0.6%	18.8%	**33.5%**
(145,351 acres)	2014-2023	15.5%	2.0%	15.1%	**32.6%**
	2024-2033	17.2%	3.7%	15.2%	**36.2%**
	2034-2043	22.3%	3.4%	14.8%	**40.5%**
	2044-2053	14.6%	1.1%	15.0%	**30.8%**
	2054-2063	18.5%	4.1%	12.3%	**34.8%**
	2064-2067	3.5%	0.4%	2.1%	**6.1%**
	Mean 2004-2067	16.5%	2.4%	14.6%	**33.5%**
S. COAST	2004-2013	5.1%	12.6%	11.5%	**29.1%**
(36,659 acres)	2014-2023	10.2%	10.0%	12.9%	**33.0%**
	2024-2033	8.2%	10.2%	14.4%	**32.8%**
	2034-2043	12.7%	7.8%	10.5%	**31.0%**
	2044-2053	9.0%	4.3%	10.0%	**23.3%**
	2054-2063	11.6%	5.4%	13.1%	**30.1%**
	2064-2067	2.9%	0.3%	5.2%	**8.5%**
	Mean 2004-2067	9.3%	7.9%	12.1%	**29.3%**
S. PUGET	2004-2013	11.1%	9.2%	10.8%	**31.1%**
(82,055 acres)	2014-2023	14.7%	4.2%	10.7%	**29.6%**
	2024-2033	13.0%	6.0%	14.0%	**33.0%**
	2034-2043	15.5%	3.6%	11.2%	**30.2%**
	2044-2053	9.5%	3.8%	11.6%	**24.9%**
	2054-2063	10.4%	2.5%	12.4%	**25.4%**
	2064-2067	4.1%	0.7%	5.1%	**9.9%**
	Mean 2004-2067	12.2%	4.7%	11.8%	**28.8%**
STRAITS	2004-2013	13.9%	12.1%	12.5%	**38.5%**
(32,764 acres)	2014-2023	14.5%	6.2%	10.7%	**31.4%**
	2024-2033	11.5%	9.2%	9.6%	**30.3%**
	2034-2043	13.3%	5.6%	8.6%	**27.5%**
	2044-2053	15.5%	4.7%	5.7%	**26.0%**
	2054-2063	11.9%	5.6%	7.5%	**25.0%**
	2064-2067	4.0%	0.7%	5.7%	**10.4%**
	Mean 2004-2067	13.2%	6.9%	9.4%	**29.5%**
Total	2004-2013	9.6%	4.8%	11.8%	**26.2%**
(362,706 acres)	2014-2023	12.1%	3.7%	11.3%	**27.1%**
	2024-2033	12.3%	4.7%	12.3%	**29.3%**
	2034-2043	14.9%	3.4%	10.9%	**29.2%**
	2044-2053	10.7%	2.8%	10.8%	**24.2%**
	2054-2063	11.1%	2.9%	10.5%	**24.5%**
	2064-2067	3.2%	0.6%	4.0%	**7.8%**
	Mean 2004-2067	11.5%	3.6%	11.2%	**26.3%**

OESF = Olympic Experimental State Forest

Table D-7f. Percent of the Upland Areas with Specific Management Objectives Land Class in which Timber Harvest Activities Would Occur per Decade under the Preferred Alternative, by HCP Planning Unit

HCP Planning Unit (Specific Acres)	Decade	Upland Areas with Specific Management Objectives Preferred Alternative — Harvest Type: A (Area Net)	B (Area Gross)	C (Area Gross)	Total
COLUMBIA	2004-2013	0.8%	3.2%	17.7%	**21.7%**
(99,462 acres)	2014-2023	0.3%	0.5%	9.7%	**10.6%**
	2024-2033	1.0%	1.6%	8.4%	**11.1%**
	2034-2043	2.4%	1.6%	8.9%	**12.9%**
	2044-2053	5.1%	2.0%	14.0%	**21.1%**
	2054-2063	5.7%	2.4%	7.1%	**15.2%**
	2064-2067	3.4%	0.8%	3.9%	**8.2%**
	Mean 2004-2067	2.9%	1.9%	10.9%	**15.7%**
N. PUGET	2004-2013	0.3%	0.8%	8.7%	**9.8%**
(204,975 acres)	2014-2023	0.3%	0.3%	5.4%	**6.1%**
	2024-2033	0.8%	0.8%	7.2%	**8.8%**
	2034-2043	0.6%	1.5%	7.1%	**9.2%**
	2044-2053	0.3%	1.4%	7.8%	**9.5%**
	2054-2063	1.0%	2.8%	5.5%	**9.4%**
	2064-2067	1.6%	0.9%	2.1%	**4.7%**
	Mean 2004-2067	0.8%	1.3%	6.8%	**9.0%**
OESF	2004-2013	0.6%	0.3%	10.8%	**11.6%**
(145,351 acres)	2014-2023	0.3%	0.3%	8.1%	**8.7%**
	2024-2033	0.7%	0.4%	13.3%	**14.4%**
	2034-2043	0.2%	1.9%	13.0%	**15.2%**
	2044-2053	0.8%	0.7%	10.1%	**11.6%**
	2054-2063	1.4%	1.4%	7.1%	**9.8%**
	2064-2067	1.6%	0.5%	2.3%	**4.3%**
	Mean 2004-2067	0.9%	0.8%	10.1%	**11.8%**
S. COAST	2004-2013	0.2%	0.6%	17.1%	**17.9%**
(36,659 acres)	2014-2023	0.0%	0.2%	7.2%	**7.5%**
	2024-2033	1.2%	3.9%	10.2%	**15.3%**
	2034-2043	1.1%	3.7%	10.8%	**15.6%**
	2044-2053	1.4%	5.8%	8.5%	**15.8%**
	2054-2063	1.3%	3.3%	6.4%	**11.0%**
	2064-2067	4.1%	2.9%	3.2%	**10.1%**
	Mean 2004-2067	1.5%	3.2%	9.9%	**14.6%**
S. PUGET	2004-2013	0.7%	2.3%	15.4%	**18.4%**
(82,055 acres)	2014-2023	0.7%	0.3%	6.6%	**7.7%**
	2024-2033	1.6%	1.6%	8.8%	**12.0%**
	2034-2043	1.7%	2.6%	9.4%	**13.8%**
	2044-2053	2.1%	3.5%	14.1%	**19.7%**
	2054-2063	1.7%	3.8%	6.6%	**12.0%**
	2064-2067	2.9%	1.5%	2.9%	**7.2%**
	Mean 2004-2067	1.8%	2.4%	10.0%	**14.2%**
STRAITS	2004-2013	1.2%	5.2%	14.2%	**20.6%**
(32,764 acres)	2014-2023	0.4%	0.6%	6.9%	**8.0%**
	2024-2033	1.6%	3.4%	6.8%	**11.8%**
	2034-2043	1.4%	3.5%	6.1%	**10.9%**
	2044-2053	1.4%	6.3%	5.9%	**13.5%**
	2054-2063	1.1%	4.8%	4.4%	**10.3%**
	2064-2067	3.0%	2.1%	2.1%	**7.2%**
	Mean 2004-2067	1.6%	4.0%	7.2%	**12.9%**
Total	2004-2013	0.5%	1.5%	12.4%	**14.4%**
(362,706 acres)	2014-2023	0.4%	0.4%	7.1%	**7.8%**
	2024-2033	1.0%	1.3%	9.3%	**11.5%**
	2034-2043	1.1%	2.0%	9.3%	**12.4%**
	2044-2053	1.6%	2.2%	10.2%	**13.9%**
	2054-2063	2.0%	2.7%	6.3%	**11.0%**
	2064-2067	2.3%	1.0%	2.6%	**6.0%**
	Mean 2004-2067	1.4%	1.7%	8.9%	**12.0%**

OESF = Olympic Experimental State Forest

Table D-8a. Percent of Land Class Area[1/] Expected in Three Stand Development Stage Categories by HCP Planning Unit and Year for Alternative 1

		Alternative 1								
		Land Class								
		Uplands with General Objectives			Riparian			Uplands with Specific Objectives		
HCP Planning Unit	Year	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]
COLUMBIA	2004	9.6%	72.7%	17.7%	4.7%	72.8%	22.6%	6.5%	67.8%	25.7%
	2013	22.5%	64.5%	13.0%	1.1%	76.4%	22.4%	4.2%	71.0%	24.9%
	2031	15.6%	69.0%	15.4%	1.0%	76.5%	22.6%	7.8%	68.5%	23.7%
	2067	20.7%	64.3%	15.0%	1.8%	72.6%	25.6%	11.7%	62.5%	25.7%
N. PUGET	2004	13.9%	66.2%	19.9%	5.4%	64.6%	30.0%	7.3%	62.8%	29.9%
	2013	21.8%	64.8%	13.4%	1.7%	68.5%	29.8%	5.0%	66.2%	28.8%
	2031	14.9%	68.3%	16.7%	1.2%	68.7%	30.1%	5.2%	65.5%	29.3%
	2067	23.9%	60.0%	16.1%	1.5%	63.2%	35.3%	7.0%	58.9%	34.1%
OESF	2004				5.3%	66.4%	28.3%	8.2%	65.8%	26.0%
	2013				0.6%	70.7%	28.7%	2.5%	71.7%	25.8%
	2031				0.9%	69.7%	29.4%	3.6%	69.8%	26.6%
	2067				1.6%	66.9%	31.5%	3.4%	67.9%	28.7%
S. COAST	2004	9.4%	73.8%	16.8%	4.8%	76.1%	19.1%	5.8%	73.0%	21.2%
	2013	15.7%	70.3%	13.9%	1.1%	79.9%	19.1%	3.7%	75.4%	20.9%
	2031	11.2%	74.4%	14.4%	1.0%	79.5%	19.5%	5.9%	72.4%	21.7%
	2067	13.4%	68.4%	18.2%	1.5%	71.1%	27.4%	4.7%	65.6%	29.7%
S. PUGET	2004	12.0%	65.6%	22.4%	5.1%	66.7%	28.2%	8.3%	67.1%	24.6%
	2013	27.1%	56.5%	16.4%	1.0%	71.0%	28.0%	7.8%	69.5%	22.7%
	2031	15.8%	65.3%	18.9%	0.8%	71.0%	28.2%	6.1%	70.0%	23.9%
	2067	26.6%	54.9%	18.5%	1.3%	68.1%	30.6%	11.6%	63.4%	25.0%
STRAITS	2004	11.0%	66.9%	22.1%	4.9%	66.7%	28.4%	5.8%	64.7%	29.5%
	2013	16.1%	66.2%	17.7%	1.0%	70.8%	28.2%	2.3%	68.7%	29.0%
	2031	14.0%	67.9%	18.0%	1.0%	70.5%	28.5%	3.6%	66.9%	29.5%
	2067	18.6%	61.4%	20.0%	1.3%	68.0%	30.7%	4.6%	62.7%	32.7%
Total	**2004**	**10.9%**	**59.6%**	**11.4%**	**5.9%**	**69.2%**	**18.3%**	**12.2%**	**92.5%**	**27.0%**
	2013	**19.5%**	**56.2%**	**8.7%**	**1.3%**	**73.2%**	**18.3%**	**7.3%**	**97.9%**	**26.1%**
	2031	**13.8%**	**59.6%**	**9.7%**	**1.2%**	**72.8%**	**18.6%**	**8.9%**	**96.0%**	**26.5%**
	2067	**19.2%**	**54.0%**	**10.4%**	**1.9%**	**68.2%**	**21.4%**	**12.1%**	**88.6%**	**29.8%**

1. Approximate acreage for each land class and HCP Planning Unit are present in Table 4.2-9.
2. Includes the ecosystem initiation stand development stage.
3. Includes the sapling exclusion, pole exclusion, large tree exclusion, and understory development stand development stages.
4. Includes the botanical diversity, niche diversification, and fully functional stand development stages.

OESF = Olympic Experimental State Forest

Table D-8b. Percent of Land Class Area[1/] Expected in Three Stand Development Stage Categories by HCP Planning Unit and Year for Alternative 2

		Alternative 2								
		Land Class								
		Uplands with General Objectives			Riparian			Uplands with Specific Objectives		
HCP Planning Unit	Year	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]
COLUMBIA	2004	9.3%	72.9%	17.7%	4.8%	72.7%	22.5%	8.1%	66.9%	25.1%
	2013	16.7%	69.1%	14.3%	2.1%	75.7%	22.2%	12.8%	65.4%	21.7%
	2031	15.5%	69.7%	14.8%	2.2%	75.6%	22.2%	10.8%	66.7%	22.5%
	2067	14.4%	69.6%	16.0%	3.1%	71.8%	25.1%	11.6%	63.8%	24.6%
N. PUGET	2004	11.3%	67.8%	20.9%	5.3%	64.7%	30.0%	7.4%	62.7%	29.9%
	2013	17.7%	67.7%	14.7%	2.4%	68.1%	29.5%	8.7%	63.7%	27.6%
	2031	10.9%	70.8%	18.3%	2.0%	68.1%	29.8%	8.7%	63.1%	28.2%
	2067	17.4%	60.4%	22.2%	2.4%	62.4%	35.2%	10.4%	55.6%	34.1%
OESF	2004				5.2%	66.4%	28.3%	7.9%	66.1%	26.0%
	2013				1.3%	70.3%	28.4%	6.1%	69.4%	24.5%
	2031				2.9%	68.3%	28.7%	8.2%	66.1%	25.7%
	2067				5.6%	63.3%	31.1%	10.3%	61.4%	28.3%
S. COAST	2004	8.5%	74.4%	17.1%	4.8%	76.1%	19.1%	5.4%	73.4%	21.2%
	2013	17.2%	69.8%	13.0%	2.2%	79.1%	18.7%	12.2%	69.3%	18.5%
	2031	15.7%	70.9%	13.4%	1.9%	78.9%	19.2%	11.8%	68.9%	19.3%
	2067	15.7%	69.4%	15.0%	3.3%	70.9%	25.8%	13.0%	64.9%	22.1%
S. PUGET	2004	10.1%	67.2%	22.7%	4.9%	67.2%	28.0%	9.3%	67.3%	23.4%
	2013	14.5%	65.3%	20.1%	1.8%	70.6%	27.6%	12.7%	67.3%	20.0%
	2031	12.2%	67.4%	20.4%	2.2%	70.2%	27.6%	11.3%	66.9%	21.9%
	2067	15.7%	62.6%	21.7%	2.0%	67.7%	30.4%	11.5%	65.6%	22.9%
STRAITS	2004	12.9%	66.0%	21.1%	4.9%	66.8%	28.3%	6.2%	64.7%	29.1%
	2013	18.1%	65.1%	16.8%	2.3%	70.0%	27.7%	12.0%	62.5%	25.4%
	2031	12.3%	67.9%	19.8%	2.2%	69.6%	28.2%	7.2%	64.1%	28.7%
	2067	14.8%	63.1%	22.1%	2.7%	67.1%	30.2%	6.4%	61.6%	31.9%
Total	**2004**	**10.1%**	**60.1%**	**11.5%**	**5.9%**	**69.2%**	**18.3%**	**12.8%**	**92.4%**	**26.7%**
	2013	**17.1%**	**57.9%**	**8.9%**	**2.3%**	**72.6%**	**18.1%**	**16.1%**	**93.2%**	**24.2%**
	2031	**13.8%**	**59.4%**	**9.9%**	**2.7%**	**72.0%**	**18.3%**	**15.6%**	**92.1%**	**25.3%**
	2067	**15.6%**	**56.0%**	**11.1%**	**4.2%**	**66.8%**	**21.1%**	**17.7%**	**85.4%**	**28.7%**

1. Approximate acreage for each land class and HCP Planning Unit are present in Table 4.2-9.
2. Includes the ecosystem initiation stand development stage.
3. Includes the sapling exclusion, pole exclusion, large tree exclusion, and understory development stand development stages.
4. Includes the botanical diversity, niche diversification, and fully functional stand development stages.

OESF = Olympic Experimental State Forest

Table D-8c. Percent of Land Class Area[1/] Expected in Three Stand Development Stage Categories by HCP Planning Unit and Year for Alternative 3

		Alternative 3								
		Land Class								
		Uplands with General Objectives			Riparian			Uplands with Specific Objectives		
HCP Planning Unit	Year	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]
COLUMBIA	2004	8.9%	73.4%	17.7%	4.8%	72.7%	22.5%	8.2%	66.7%	25.1%
	2013	30.6%	57.9%	11.5%	2.6%	75.3%	22.0%	14.7%	64.2%	21.2%
	2031	15.0%	69.5%	15.5%	2.6%	75.3%	22.1%	11.8%	65.8%	22.4%
	2067	21.6%	63.7%	14.7%	3.7%	71.6%	24.7%	12.9%	63.1%	23.9%
N. PUGET	2004	11.4%	67.9%	20.7%	5.4%	64.7%	30.0%	7.5%	62.7%	29.9%
	2013	13.7%	70.1%	16.3%	1.9%	68.4%	29.7%	6.4%	65.2%	28.4%
	2031	23.5%	61.7%	14.8%	3.3%	67.3%	29.4%	12.3%	61.0%	26.8%
	2067	16.8%	65.5%	17.7%	2.9%	62.6%	34.5%	10.8%	56.8%	32.4%
OESF	2004				5.2%	66.5%	28.3%	7.9%	66.2%	26.0%
	2013				0.6%	70.7%	28.7%	2.1%	72.1%	25.8%
	2031				2.1%	69.0%	29.0%	10.4%	64.2%	25.4%
	2067				3.2%	65.9%	30.9%	4.9%	66.7%	28.4%
S. COAST	2004	8.1%	74.7%	17.2%	4.7%	76.1%	19.2%	5.0%	73.8%	21.2%
	2013	28.8%	60.8%	10.4%	2.9%	78.5%	18.6%	16.7%	65.8%	17.5%
	2031	13.5%	71.9%	14.5%	2.3%	78.5%	19.2%	9.2%	71.1%	19.7%
	2067	19.6%	66.5%	13.8%	4.7%	70.2%	25.2%	17.2%	62.5%	20.3%
S. PUGET	2004	10.3%	67.0%	22.7%	4.9%	67.1%	28.0%	9.5%	67.0%	23.4%
	2013	30.2%	55.1%	14.6%	2.5%	70.2%	27.3%	17.8%	64.2%	18.0%
	2031	17.8%	63.4%	18.9%	2.3%	70.2%	27.5%	9.5%	68.5%	22.0%
	2067	18.3%	60.9%	20.8%	2.1%	67.6%	30.3%	15.5%	63.1%	21.4%
STRAITS	2004	12.5%	66.3%	21.2%	4.9%	66.8%	28.3%	5.7%	65.0%	29.3%
	2013	28.2%	58.6%	13.1%	3.2%	69.4%	27.4%	15.8%	60.4%	23.9%
	2031	23.5%	61.3%	15.2%	4.1%	68.6%	27.3%	18.9%	58.4%	22.7%
	2067	21.7%	60.0%	18.2%	3.1%	67.3%	29.6%	10.6%	61.4%	27.9%
Total	**2004**	**9.9%**	**60.3%**	**11.5%**	**5.9%**	**69.2%**	**18.3%**	**12.8%**	**92.4%**	**26.7%**
	2013	**25.7%**	**52.3%**	**7.7%**	**2.4%**	**72.5%**	**18.1%**	**15.6%**	**93.4%**	**24.2%**
	2031	**18.0%**	**56.7%**	**9.2%**	**3.0%**	**71.8%**	**18.2%**	**19.1%**	**90.3%**	**24.4%**
	2067	**19.7%**	**54.6%**	**9.7%**	**4.0%**	**67.3%**	**20.7%**	**17.8%**	**87.0%**	**27.5%**

1. Approximate acreage for each land class and HCP Planning Unit are present in Table 4.2-9.
2. Includes the ecosystem initiation stand development stage.
3. Includes the sapling exclusion, pole exclusion, large tree exclusion, and understory development stand development stages.
4. Includes the botanical diversity, niche diversification, and fully functional stand development stages.

OESF = Olympic Experimental State Forest

Table D-8d. Percent of Land Class Area[1/] Expected in Three Stand Development Stage Categories by HCP Planning Unit and Year for Alternative 4

		Alternative 4								
		Land Class								
		Uplands with General Objectives			Riparian			Uplands with Specific Objectives		
HCP Planning Unit	Year	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]
COLUMBIA	2004	8.7%	73.5%	17.7%	4.5%	72.9%	22.5%	6.7%	67.9%	25.4%
	2013	12.7%	72.7%	14.6%	1.0%	76.5%	22.4%	3.3%	72.0%	24.7%
	2031	21.6%	65.0%	13.4%	0.9%	76.5%	22.6%	6.8%	68.6%	24.6%
	2067	15.9%	66.2%	17.9%	1.4%	72.8%	25.7%	11.8%	62.4%	25.8%
N. PUGET	2004	12.1%	67.3%	20.7%	5.2%	64.8%	30.0%	7.2%	62.9%	29.9%
	2013	14.6%	69.1%	16.3%	1.5%	68.6%	29.8%	5.0%	66.2%	28.8%
	2031	19.8%	65.0%	15.2%	1.1%	68.7%	30.2%	7.6%	63.5%	28.9%
	2067	21.8%	57.9%	20.3%	1.2%	63.3%	35.5%	8.2%	57.5%	34.4%
OESF	2004				5.2%	66.5%	28.3%	8.2%	65.7%	26.1%
	2013				0.5%	70.8%	28.8%	1.8%	71.9%	26.3%
	2031				0.5%	70.1%	29.4%	1.9%	71.3%	26.7%
	2067				0.4%	68.0%	31.6%	2.2%	68.7%	29.2%
S. COAST	2004	9.1%	74.2%	16.7%	4.7%	76.2%	19.1%	5.1%	73.7%	21.2%
	2013	11.0%	74.7%	14.3%	1.0%	80.0%	19.1%	5.3%	74.7%	20.0%
	2031	22.0%	65.5%	12.4%	1.4%	79.2%	19.4%	8.9%	70.2%	20.9%
	2067	16.0%	66.7%	17.3%	1.8%	71.2%	27.1%	10.7%	63.8%	25.5%
S. PUGET	2004	7.5%	69.0%	23.4%	4.4%	67.3%	28.2%	6.3%	68.5%	25.2%
	2013	5.6%	72.3%	22.1%	0.6%	71.3%	28.2%	3.5%	71.9%	24.6%
	2031	15.1%	65.9%	19.0%	0.7%	71.2%	28.2%	5.9%	71.0%	23.1%
	2067	15.6%	63.6%	20.8%	1.0%	68.1%	30.9%	7.2%	65.9%	26.9%
STRAITS	2004	9.5%	68.5%	22.0%	4.5%	67.1%	28.4%	5.2%	65.4%	29.4%
	2013	11.3%	70.1%	18.6%	1.1%	70.7%	28.2%	5.2%	67.2%	27.6%
	2031	22.1%	62.2%	15.7%	1.3%	70.2%	28.5%	7.8%	63.5%	28.8%
	2067	13.8%	65.2%	20.9%	1.3%	68.3%	30.5%	8.2%	61.5%	30.3%
Total	**2004**	**9.6%**	**60.5%**	**11.6%**	**5.7%**	**69.3%**	**18.3%**	**11.6%**	**92.9%**	**27.0%**
	2013	**11.9%**	**61.3%**	**9.7%**	**1.1%**	**73.2%**	**18.3%**	**6.3%**	**98.5%**	**26.3%**
	2031	**20.9%**	**55.1%**	**8.6%**	**1.1%**	**72.9%**	**18.6%**	**9.9%**	**95.3%**	**26.4%**
	2067	**16.9%**	**54.5%**	**11.4%**	**1.3%**	**68.6%**	**21.5%**	**12.2%**	**88.4%**	**29.9%**

1. Approximate acreage for each land class and HCP Planning Unit are present in Table 4.2-9.
2. Includes the ecosystem initiation stand development stage.
3. Includes the sapling exclusion, pole exclusion, large tree exclusion, and understory development stand development stages.
4. Includes the botanical diversity, niche diversification, and fully functional stand development stages.

OESF = Olympic Experimental State Forest

Table D-8e. Percent of Land Class Area[1/] Expected in Three Stand Development Stage Categories by HCP Planning Unit and Year for Alternative 5

		Alternative 5								
		Land Class								
		Uplands with General Objectives			Riparian			Uplands with Specific Objectives		
HCP Planning Unit	Year	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]
COLUMBIA	2004	18.5%	66.1%	15.4%	5.3%	72.3%	22.4%	10.4%	64.8%	24.9%
	2013	23.3%	64.0%	12.7%	2.9%	75.3%	21.8%	17.0%	62.0%	21.0%
	2031	18.8%	65.8%	15.4%	3.3%	74.7%	22.0%	15.9%	63.7%	20.4%
	2067	18.6%	66.9%	14.5%	3.1%	72.2%	24.6%	18.2%	60.0%	21.8%
N. PUGET	2004	13.9%	66.2%	19.9%	5.6%	64.6%	29.8%	8.3%	62.3%	29.4%
	2013	16.2%	67.6%	16.1%	2.5%	68.1%	29.4%	8.1%	64.3%	27.5%
	2031	22.8%	62.4%	14.9%	3.3%	67.3%	29.4%	13.0%	60.2%	26.8%
	2067	16.7%	66.3%	17.0%	2.3%	63.1%	34.6%	9.1%	58.6%	32.3%
OESF	2004				5.5%	66.3%	28.3%	10.6%	64.5%	24.9%
	2013				2.2%	69.9%	27.8%	21.0%	61.0%	18.0%
	2031				2.8%	69.2%	27.9%	21.3%	60.7%	18.0%
	2067				2.9%	68.4%	28.7%	16.5%	67.6%	15.9%
S. COAST	2004	15.0%	69.4%	15.6%	5.6%	75.5%	18.9%	8.2%	71.1%	20.7%
	2013	19.1%	68.0%	12.9%	2.8%	78.5%	18.7%	12.8%	68.8%	18.4%
	2031	19.1%	68.5%	12.4%	3.5%	77.6%	18.9%	14.6%	66.5%	18.9%
	2067	15.8%	69.6%	14.5%	3.1%	71.0%	25.9%	14.0%	64.3%	21.7%
S. PUGET	2004	17.0%	61.9%	21.1%	5.1%	67.0%	28.0%	11.1%	65.2%	23.7%
	2013	25.1%	57.4%	17.5%	2.5%	70.1%	27.4%	14.4%	65.2%	20.4%
	2031	15.8%	65.6%	18.6%	2.8%	69.6%	27.5%	17.0%	62.7%	20.2%
	2067	20.8%	59.3%	19.9%	2.7%	67.4%	29.9%	15.1%	63.3%	21.7%
STRAITS	2004	14.9%	64.7%	20.4%	5.1%	66.7%	28.2%	6.5%	64.3%	29.3%
	2013	25.2%	60.1%	14.7%	3.2%	69.4%	27.4%	14.4%	60.3%	25.2%
	2031	17.3%	65.7%	17.0%	2.9%	69.3%	27.8%	14.2%	61.0%	24.8%
	2067	21.6%	59.9%	18.5%	4.0%	66.5%	29.4%	13.2%	59.6%	27.2%
Total	**2004**	**15.6%**	**56.7%**	**10.7%**	**6.4%**	**68.9%**	**18.2%**	**15.7%**	**90.6%**	**26.2%**
	2013	**20.7%**	**55.3%**	**8.6%**	**3.0%**	**72.2%**	**17.9%**	**23.5%**	**89.2%**	**22.5%**
	2031	**19.4%**	**56.0%**	**8.9%**	**3.7%**	**71.5%**	**18.0%**	**26.9%**	**86.9%**	**22.1%**
	2067	**17.9%**	**56.1%**	**9.7%**	**3.4%**	**68.4%**	**20.4%**	**22.7%**	**87.4%**	**24.2%**

1. Approximate acreage for each land class and HCP Planning Unit are present in Table 4.2-9.
2. Includes the ecosystem initiation stand development stage.
3. Includes the sapling exclusion, pole exclusion, large tree exclusion, and understory development stand development stages.
4. Includes the botanical diversity, niche diversification, and fully functional stand development stages.

OESF = Olympic Experimental State Forest

Table D-8f. Percent of Land Class Area[1/] Expected in Three Stand Development Stage Categories by HCP Planning Unit and Year for the Preferred Alternative

		Preferred Alternative								
		Land Class								
		Uplands with General Objectives			Riparian			Uplands with Specific Objectives		
HCP Planning Unit	Year	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]	Ecosystem Initiation[2/]	Competitive Exclusion[3/]	Structurally Complex[4/]
COLUMBIA	2004	10.8%	72.0%	17.2%	4.8%	72.7%	22.5%	7.4%	67.3%	25.2%
	2013	35.0%	55.5%	9.6%	3.0%	75.1%	22.0%	11.0%	64.1%	24.9%
	2031	16.1%	68.5%	15.4%	2.1%	67.7%	30.3%	10.2%	58.7%	31.0%
	2067	21.6%	64.9%	13.5%	8.5%	60.4%	31.1%	10.3%	54.6%	35.1%
N. PUGET	2004	14.8%	65.8%	19.4%	5.4%	64.6%	30.0%	7.1%	62.9%	30.0%
	2013	25.6%	62.3%	12.1%	3.8%	67.1%	29.1%	7.3%	64.0%	28.7%
	2031	16.0%	66.4%	17.6%	2.2%	65.7%	32.1%	6.0%	63.0%	31.0%
	2067	15.2%	66.1%	18.6%	5.9%	56.9%	37.3%	8.4%	56.0%	35.6%
OESF	2004				5.5%	66.2%	28.3%	7.9%	66.2%	26.0%
	2013				4.3%	68.3%	27.4%	10.0%	67.8%	22.2%
	2031				3.7%	67.6%	28.7%	10.7%	64.0%	25.2%
	2067				7.9%	62.5%	29.6%	8.2%	65.1%	26.7%
S. COAST	2004	9.0%	74.0%	17.0%	4.8%	76.0%	19.2%	5.0%	73.8%	21.2%
	2013	30.2%	59.6%	10.2%	3.1%	78.3%	18.6%	8.5%	68.1%	23.5%
	2031	16.6%	69.5%	13.8%	2.3%	72.0%	25.7%	6.5%	65.2%	28.4%
	2067	16.9%	68.7%	14.4%	9.4%	58.3%	32.3%	10.2%	54.2%	35.6%
S. PUGET	2004	13.2%	65.0%	21.7%	4.8%	67.1%	28.1%	8.0%	67.8%	24.2%
	2013	23.4%	59.7%	17.0%	2.1%	70.1%	27.8%	9.4%	68.0%	22.7%
	2031	15.0%	65.6%	19.3%	1.1%	66.7%	32.2%	6.6%	62.2%	31.2%
	2067	17.1%	63.2%	19.7%	5.3%	61.2%	33.4%	10.6%	56.1%	33.3%
STRAITS	2004	16.8%	63.3%	19.9%	5.0%	66.7%	28.4%	5.4%	65.2%	29.5%
	2013	29.8%	57.4%	12.8%	3.4%	69.2%	27.4%	7.3%	62.6%	30.2%
	2031	16.4%	65.4%	18.2%	3.1%	61.4%	35.5%	4.9%	57.6%	37.5%
	2067	19.8%	62.2%	18.0%	9.3%	53.7%	37.0%	11.8%	48.0%	40.2%
Total	**2004**	**12.3%**	**58.9%**	**11.1%**	**6.0%**	**69.1%**	**18.3%**	**12.0%**	**92.8%**	**26.9%**
	2013	**29.7%**	**50.1%**	**6.8%**	**4.1%**	**71.5%**	**17.8%**	**14.8%**	**92.5%**	**25.4%**
	2031	**16.2%**	**57.5%**	**9.7%**	**3.0%**	**67.7%**	**21.1%**	**13.1%**	**87.7%**	**29.8%**
	2067	**18.0%**	**56.0%**	**9.7%**	**9.1%**	**59.5%**	**23.2%**	**15.3%**	**80.9%**	**33.3%**

1. Approximate acreage for each land class and HCP Planning Unit are present in Table 4.2-9.
2. Includes the ecosystem initiation stand development stage.
3. Includes the sapling exclusion, pole exclusion, large tree exclusion, and understory development stand development stages.
4. Includes the botanical diversity, niche diversification, and fully functional stand development stages.

OESF = Olympic Experimental State Forest

D.2 ADDITIONAL DATA FOR THREATENED, ENDANGERED, AND SENSITIVE PLANTS

Table D-9 provides detailed information on Washington threatened, endangered, and sensitive vascular plants.

Appendix D

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Table D-9. Washington Threatened, Endangered, and Sensitive Vascular Plants for Counties with Forested Trust Lands - 2003

Species	State Rank	Global Rank	New State Status	US ESA Status	No. of WAUs with recorded occurrences	Habitat
Habitats May Occur in Harvestable Forests						
Botrychium pedunculosum	S2S3	G2G3	S	SC		Mesic to moist meadows or forests
Chrysolepis chrysophylla	S2	G5	S		7	Dry, open to thick wooded areas
Cimicifuga elata	S3	G3	S	SC	49	Moist, shady woods, lower elevation
Claytonia lanceolata var pacifica	S1S2	G5T3	T			Foothills to alpine
Coptis aspleniifolia	S2	G4G5	S			Moist coniferous forests
Cypripedium fasciculatum	S3	G4	S	SC		Coniferous forest
Euonymus occidentalis	S1	G5	T		5	Woods
Lathyrus torreyi	S1	G5	T	SC	6	Mixed conifer forest
Pityopus californica	S1	G4G5	T			Deep coniferous forests
Platanthera obtusata	S2	G5	S			Damp to wet forests
Viola renifolia	S2	G5	S			Lowland forest to subalpine slopes
May Occur in Areas Adjacent to or within Harvestable Forests						
Agoseris elata	S3	G4	S		5	Meadows, open woods
Arenaria paludicola	SX	G1	X	LE	1	Wetlands, freshwater marshes at low elevations
Botrychium ascendens	S2S3	G2G3?	S	SC		Mid - upper elevations, ridges and meadows
Campanula lasiocarpa	S2	G5	S			Rock crevices in alpine
Carex comosa	S2	G5	S		10	Marshes, lake margins, wet meadows, other wet places
Carex densa	S1	G5	T			Eroding hummocks in marshland
Carex flava	S3	G5	S			Wet places
Carex magellanica ssp irrigua	S2S3	G5T5	S		3	Bogs, fens, wet meadows
Carex pauciflora	S2	G5	S		10	Sphagnum bogs
Carex pluriflora	S1S2	G4	S		1	Boggy lake margins, streambanks, saturated areas
Carex scirpoidea var scirpoidea	S2	G5T4T5	S			Moist meadows, rock outcrops, near and above timberline
Carex stylosa	S1S2	G5	S		10	Spagnum peat or sloping wetlands with surface seepage
Cassiope lycopodioides	S1	G4	T		2	Occurs in Alaska; here found on cliffs, cold deep ravine
Castilleja cryptantha	S2S3	G2G3	S	SC		Subalpine meadows; endemic to Mt. Ranier National Park
Castilleja levisecta	S1	G1	E	ST	13	grasslands
Cicuta bulbifera	S2	G5	S			Wet places or standing water
Cochlearia officinalis	S1S2	G5	S		3	Coastal beaches
Collinsia sparsiflora var bruceae	S1S2	G4T4	S			Open slopes and swales
Corydalis aquae-gelidae	S2S3	G3	S	SC	2	Creeks and seeps above 2,500 ft.
Crassula connata	S1S2	G5	T			Open areas
Cyperus bipartitus	S2	G5	S			Streambanks, wet low places
Delphinium leucophaeum	S1	G2Q	E			Lowland praries
Dryas drummondii	S2	G5	S			Cliff crevices, talus, rocky ridges
Erigeron aliceae	S2	G4	S		1	Meadows, openings in woods
Erigeron howellii	S2	G2	T	SC	5	Non-forested areas
Erigeron oreganus	S2	G3	T	SC		Exposed basalt
Erigeron peregrinus ssp peregrinus var	S2	G5T2	S			Bogs
Eryngium petiolatum	S1	G4	T			Areas submerged in spring, dry late summer
Erythronium revolutum	S3	G4	S		50	Along streams and edges of bogs
Filipendula occidentalis	S2S3	G2G3	T	SC	8	Riparian areas
Fritillaria camschatcensis	S2	G5	S		3	Moist to wet meadows, riparian
Gaultheria hispidula	S2	G5	S			Bogs
Gentiana douglasiana	S2S3	G4	S		4	Bogs
Githopsis specularioides	S3	G5	S		2	Dry, open areas
Hedysarum occidentale	S1	G5	S			Open areas with dry, rocky soils
Howellia aquatilis	S2S3	G3	T	LT		Shallow ponds in lowland forested areas
Hydrocotyle ranunculoides	S2	G5	S			Marshes and wet ground
Hypericum majus	S2	G5	S		3	Wet ground
Isoetes nuttallii	S1	G4?	S		1	Terrestrial in wet ground or seeps and mud near vernal pools
Lathyrus holochlorus	S1	G3	E			Forest borders and openings
Liparis loeselii	S1	G5	E			Springs, bogs, wet sunny places
Lobelia dortmanna	S2S3	G4	T		14	Shallow water at lake margins
Loiseleuria procumbens	S1	G5	T			Moist meadow
Lomatium bradshawii	S1	G2	E	LE		Moist to wet meadows
Lycopodiella inundata	S2	G5	S		1	Sphagnum bogs
Lycopodium dendroideum	S2	G5	S			Dry rocky slopes and open coniferous forests
Meconella oregana	S2	G3?	T	SC		Grasslands and savannahs
Microseris borealis	S2	G4?	S			Sphagnum bogs and wet to moist meadows
Montia diffusa	S2S3	G4	S		5	Moist woods at lower elevation

Table D-9. Washington Threatened, Endangered, and Sensitive Vascular Plants for Counties with Forested Trust Lands - 2003 (continued)

Species	State Rank	Global Rank	New State Status	US ESA Status	No. of WAUs with recorded occurrences	Habitat
Ophioglossum pusillum	S1S2	G5	T		13	Mesic to moist meadows in low to subalpine
Orthocarpus bracteosus	S1	G3?	E		8	Moist meadows
Oxalis suksdorfii	S1	G4	T		2	Moist coastal woods to dry open slopes
Parnassia fimbriata var hoodiana	S1	G4T3	T			Streambanks, bogs,wet meadows
Parnassia palustris var neogaea	S2	G4T4	S		6	Shaded areas in mountains to alpine
Platanthera chorisiana	S2	G3	T		1	Wet meadows, rocky seeps, lake shores
Platanthera sparsiflora	S1	G4G5	T			Moist to wet or boggy areas
Poa laxiflora	S1S2	G3	T		1	Moist woods to rocky slopes
Poa nervosa	S2	G3?	S			Montaine
Polemonium carneum	S1S2	G4	T		49	Thickets, woodland, forest openings
Polystichum californicum	S1S2	G4	S		1	Woods, streambanks, open rocky places
Ranunculus populago	S2	G4	S			Wet montaine areas
Ribes oxyacanthoides ssp irriguum	S2	G5T3T4	S		1	Prairie and lower mountains
Rorippa columbiae	S1S2	G3	E	SC		Moist to marshy places
Rotala ramosior	S1	G5	T			Wet places
Salix sessilifolia	S2	G4	S		4	Streambanks
Samolus parviflorus	S1	G5	S			Moist sites
Sidalcea hirtipes	S1	G2	E		11	Prairies, openings along drainages
Sidalcea malviflora ssp virgata	S1	G5T?	E			Prairie, grassland
Sidalcea nelsoniana	S1	G2	E	LT		Moist meadows
Sisyrinchium sarmentosum	S1S2	G1G2	T	SC		Meadows
Sparganium fluctuans	S1	G5	T			aquatic or marshy areas
Spiranthes porrifolia	S2	G4	S			Wet meadows, stream banks, seepage slopes
Synthyris pinnatifida var lanuginosa	S2	G4T2	T			Olympic Mountains
Trillium parviflorum	S2S3	G2G3	S		8	Moist areas dominated by hardwoods
Utricularia intermedia	S2	G5	S		1	Shallow ponds, slow-moving streams, high elevation
Woodwardia fimbriata	S2	G5	S		22	Streambanks and wet places
Habitats are in Non-Forested Areas not Likely to be Adjacent to Harvestable Forests						
Abronia umbellata	SX	G4G5T1	X	SC	9	Sandy beach
Aster borealis	S1	G5	T			Prairie
Aster curtus	S3	G3	S	SC	4	Lowland praries
Aster sibiricus var meritus	S1S2	G5T5	S			Unstable, rocky or gravelly substrate
Astragalus australis var olympicus	S2	G5T2	T	SC		Talus slopes, ridges, and knolls of calcareous substrates
Astragalus microcystis	S2	G5	S			Dry, gravelly soils in alpine; Olympic Mnts
Bolandra oregana	S2	G3	S		6	Moist, shady cliffs, rock outcrops
Carex anthoxanthea	S1	G5	S			Subalpine at seepage sites
Carex circinata	S1	G4	S			rock outcrops at high elevations
Carex macrochaeta	S1	G5	T			Seepage areas and around waterfalls
Carex obtusata	S2	G5	S			Grassy places to high mountains
Chaenactis thompsonii	S2S3	G2G3	S			Serpentine slopes; subalpine slopes
Draba aurea	S2	G5	S			Alpine,sunny rock crevasses
Draba cana	S1S2	G5	S			Subalpine to alpine, rock crevices
Draba longipes	S1	G4	T			Rocky, alpine slopes
Dodecatheon austrofrigidum	S1	G2	E			S. Olympics
Gentiana glauca	S2S3	G4G5	S			Dry to moist alpine meadows
Hackelia cinerea	S1	G4?	S			Cliffs, talus slopes
Hackelia diffusa var diffusa	S2	G4T3	T			Cliffs, talus slopes
Lepidium oxycarpum	S1	G4	T		2	fields, vernal pools, alkaline flats
Lupinus sulphureus var kincaidii	S1	G5T2	E	SL		Lowland praries
Luzula arcuata	S1	G5	S			Rocky or gravelly soil; above timberline or moraines
Nymphaea tetragona	SH	G5	X		3	Water
Oxytropis borealis var viscida	S1S2	G5T4?	S			Mid to high elevation, meadows to alpine
Pedicularis rainierensis	S2S3	G2G3	S			Mt Rainier area
Pellaea breweri	S2	G5	S			Rocky places, crevaces or talus
Penstemon barrettiae	S2	G2	T	SC		Exposed basalt
Plantago macrocarpa	S2	G4	S		5	Cold, wet places; subcoastal
Poa unilateralis	S2	G3	T			Coastal grassy bluffs
Potamogeton obtusifolius	S2	G5	S			Aquatic, submerged
Puccinellia nutkaensis	S2	G4?	S		33	Sea coast
Ranunculus californicus	S1	G5	T			Grassy, coastal bluffs
Ranunculus cooleyae	S1S2	G4	S		2	Damp rocky slopes and rock crevices
Sanguisorba menziesii	S1	G3G4	S			Coastal bogs and marshes

Table D-9. Washington Threatened, Endangered, and Sensitive Vascular Plants for Counties with Forested Trust Lands - 2003 (continued)

Species	State Rank	Global Rank	New State Status	US ESA Status	No. of WAUs with recorded occurrences	Habitat
Sanicula arctopoides	S1	G5	E		1	Coastal bluffs
Saxifraga rivularis	S3	G5?	S			Moist crevices, shady rocky areas
Sullivantia oregana	S1	G2	E	SC	2	Exposed rock

State Rank characterizes the relative rarity or endangerment within the state of Washington. Two codes (e.g. S1 and S2) represents an intermediate rank. S1 = Critically imperiled (5 or fewer occurrences); S2 = Vulnerable to extirpation (6 to 20 occurrences); S3 = Rare or uncommon (21 to 100 occurrences); S4 = Apparently secure, with many occurrences; S5 = Demonstrably secure in state; S H = Historical occurrences only but still expected to occur; SX = Apparently extirpated from the state.

Global Rank characterizes the relative rarity or endangerment of the element world-wide. Two codes (e.g. G1 and G2) represent an intermediate rank. G1 = Critically imperiled globally (5 or fewer occurrences); G2 = Imperiled globally (6 to 20 occurrences); G3 = Either very rare and local throughout its range or found locally in a restricted range (21 to 100 occurrences); G4 = Apparently secure globally; G5 = Demonstrably secure globally; GH = Of historical occurrence throughout its range; GU = Possibly in peril range-wide but status uncertain; GX = Believed to be extinct throughout former range; G? = Not ranked to date; Tn = Rarity of an infraspecific taxon. Numbers similar to those for Gn ranks above; Q = Questionable.

State Status of the species is determined by the Washington Department of Fish and Wildlife. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness. Values include: E = Endangered. In danger of becoming extinct or extirpated from Washington; T = Threatened. Likely to become Endangered in Washington; S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.

US ESA Status under the U.S. Endangered Species Act as published in the Federal Register: LE = Listed Endangered. In danger of extinction; LT = Listed Threatened. Likely to become endangered; PE = Proposed Endangered; PT = Proposed Threatened; C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened; SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing; NL = Not Listed.

Sources: Rankings from WNHP TES Database 2003. Habitats from Hitchcock 1976, WDNR 1999, Sensitive Plants and Noxious Weeds of the Nt. Baker-Snoqualmie National Forest, HCP EIS 1996, University of California and Jepson Herbaria 2003, Pacific Biodiversity Institute 2003, Wisconsin State Herbarium 2003,

Appendix D

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D.3 ADDITIONAL ANALYSES FOR THE RIPARIAN AREAS SECTION

Tables D-10a through D-10f present detailed riparian data by Alternative.

Appendix D

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Table D-10a. Percentage Distribution of Stand Development Stages in Riparian Areas under Alternative 1, by HCP Planning Unit and Year

HCP Planning Unit (Riparian Acres)	Year	Percent of Riparian Areas - Alternative 1							
		Ecosystem Initiation	Sapling Exclusion	Pole Exclusion	Large Tree Exclusion	Understory Development	Botanically Diverse	Niche Diversification	Fully Functioning
COLUMBIA	2004	4.7%	12.4%	22.3%	26.6%	11.5%	21.6%	0.1%	0.9%
(86,443 acres)	2013	1.1%	8.4%	23.9%	29.5%	14.6%	21.4%	0.2%	0.8%
	2031	1.0%	1.1%	20.0%	28.9%	26.6%	21.4%	0.3%	0.9%
	2067	1.8%	0.5%	7.7%	18.7%	45.7%	23.0%	1.7%	0.9%
N. PUGET	2004	5.4%	14.6%	16.4%	15.5%	18.1%	27.9%	0.2%	1.8%
(92,724 acres)	2013	1.7%	9.3%	20.6%	17.0%	21.6%	27.7%	0.2%	1.9%
	2031	1.2%	2.3%	19.8%	16.6%	30.0%	27.5%	0.4%	2.2%
	2067	1.5%	0.6%	7.2%	8.8%	46.7%	28.5%	1.9%	4.9%
OESF	2004	5.3%	25.0%	29.6%	5.5%	6.3%	26.3%	0.7%	1.3%
(111,308 acres)	2013	0.6%	12.9%	36.7%	11.5%	9.7%	26.2%	0.7%	1.9%
	2031	0.9%	1.6%	30.8%	16.7%	20.6%	24.7%	2.5%	2.2%
	2067	1.6%	0.8%	12.1%	7.7%	46.4%	14.8%	7.1%	9.5%
S. COAST	2004	4.8%	13.7%	16.4%	26.8%	19.1%	19.1%	0.0%	0.1%
(80,966 acres)	2013	1.1%	6.0%	22.5%	26.8%	24.6%	19.0%	0.0%	0.1%
	2031	1.0%	0.7%	18.0%	26.7%	34.1%	19.3%	0.1%	0.1%
	2067	1.5%	0.6%	3.9%	19.2%	47.5%	25.1%	2.2%	0.1%
S. PUGET (34,606	2004	5.1%	14.7%	22.2%	14.3%	15.5%	28.1%	0.1%	0.0%
acres)	2013	1.0%	11.8%	25.8%	16.3%	17.1%	27.8%	0.1%	0.0%
	2031	0.8%	1.6%	25.8%	17.8%	25.7%	27.7%	0.5%	0.0%
	2067	1.3%	0.4%	8.4%	8.4%	50.8%	28.9%	1.6%	0.2%
STRAITS	2004	4.9%	13.6%	18.3%	14.0%	20.7%	28.3%	0.1%	0.0%
(20,684 acres)	2013	1.0%	10.6%	22.1%	14.9%	23.2%	28.1%	0.1%	0.0%
	2031	1.0%	1.2%	22.3%	14.5%	32.4%	28.2%	0.2%	0.0%
	2067	1.3%	0.3%	6.5%	2.9%	58.3%	29.6%	1.0%	0.1%
Total (426,731	2004	5.0%	16.6%	21.6%	17.1%	13.8%	24.6%	0.3%	0.9%
acres)	2013	1.1%	9.7%	26.3%	19.8%	17.4%	24.4%	0.3%	1.1%
	2031	1.0%	1.4%	23.0%	21.0%	27.4%	24.0%	0.9%	1.3%
	2067	1.6%	0.6%	8.0%	12.1%	47.5%	23.2%	3.2%	3.8%

OESF = Olympic Experimental State Forest

Table D-10b. Percentage Distribution of Stand Development Stages in Riparian Areas under Alternative 2, by HCP Planning Unit and Year

HCP Planning Unit (Riparian Acres)	Year	Percent of Riparian Areas - Alternative 2							
		Ecosystem Initiation	Sapling Exclusion	Pole Exclusion	Large Tree Exclusion	Understory Development	Botanically Diverse	Niche Diversification	Fully Functioning
COLUMBIA	2004	4.8%	12.6%	22.2%	26.4%	11.5%	21.4%	0.2%	0.9%
(86,443 acres)	2013	2.1%	8.4%	23.7%	29.0%	14.7%	21.1%	0.2%	0.8%
	2031	2.2%	1.7%	20.2%	27.7%	26.0%	21.1%	0.3%	0.9%
	2067	3.1%	1.8%	11.3%	17.3%	41.4%	22.5%	1.6%	1.0%
N. PUGET	2004	5.3%	14.7%	16.4%	15.5%	18.2%	27.9%	0.2%	1.8%
(92,724 acres)	2013	2.4%	9.3%	20.5%	16.8%	21.5%	27.4%	0.2%	1.9%
	2031	2.0%	2.8%	19.9%	16.1%	29.3%	27.2%	0.4%	2.2%
	2067	2.4%	1.4%	10.1%	8.3%	42.6%	28.6%	1.8%	4.7%
OESF	2004	5.2%	25.0%	29.6%	5.4%	6.4%	26.3%	0.7%	1.3%
(111,308 acres)	2013	1.3%	12.9%	37.0%	11.4%	9.1%	25.9%	0.7%	1.9%
	2031	2.9%	1.9%	31.9%	17.1%	17.5%	24.1%	2.5%	2.2%
	2067	5.6%	1.4%	17.7%	6.8%	37.4%	14.6%	6.9%	9.5%
S. COAST	2004	4.8%	13.8%	16.4%	26.7%	19.2%	19.1%	0.0%	0.1%
(80,966 acres)	2013	2.2%	6.0%	22.5%	26.4%	24.3%	18.6%	0.0%	0.1%
	2031	1.9%	1.5%	18.7%	25.4%	33.2%	19.0%	0.1%	0.1%
	2067	3.3%	1.4%	7.8%	17.3%	44.4%	23.8%	1.9%	0.1%
S. PUGET	2004	4.9%	15.2%	22.2%	14.2%	15.5%	27.9%	0.1%	0.0%
(34,606 acres)	2013	1.8%	11.8%	25.7%	16.3%	16.8%	27.5%	0.1%	0.0%
	2031	2.2%	2.0%	26.0%	17.2%	25.0%	27.1%	0.4%	0.0%
	2067	2.0%	1.5%	12.7%	7.3%	46.1%	28.8%	1.4%	0.2%
STRAITS	2004	4.9%	14.1%	18.1%	13.9%	20.8%	28.2%	0.1%	0.0%
(20,684 acres)	2013	2.3%	10.6%	21.8%	14.6%	22.9%	27.6%	0.1%	0.0%
	2031	2.2%	2.3%	22.7%	13.6%	31.0%	28.0%	0.2%	0.0%
	2067	2.7%	1.5%	11.7%	2.4%	51.5%	29.1%	1.0%	0.1%
Total (426,731	2004	5.0%	16.8%	21.6%	17.0%	13.9%	24.5%	0.3%	0.9%
acres)	2013	1.9%	9.7%	26.3%	19.5%	17.1%	24.1%	0.3%	1.1%
	2031	2.3%	2.0%	23.5%	20.4%	26.0%	23.6%	0.8%	1.3%
	2067	3.5%	1.5%	12.2%	11.1%	42.0%	22.9%	3.0%	3.8%

OESF = Olympic Experimental State Forest

Table D-10c. Percentage Distribution of Stand Development Stages in Riparian Areas under Alternative 3, by HCP Planning Unit and Year

HCP Planning Unit (Riparian Acres)	Year	Percent of Riparian Areas - Alternative 3							
		Ecosystem Initiation	Sapling Exclusion	Pole Exclusion	Large Tree Exclusion	Understory Development	Botanically Diverse	Niche Diversification	Fully Functioning
COLUMBIA	2004	4.8%	12.6%	22.2%	26.5%	11.5%	21.4%	0.2%	0.9%
(86,443 acres)	2013	2.6%	8.4%	23.7%	28.9%	14.3%	21.0%	0.2%	0.8%
	2031	2.6%	1.9%	20.9%	27.3%	25.2%	21.1%	0.2%	0.8%
	2067	3.7%	1.8%	12.1%	17.5%	40.1%	22.6%	1.4%	0.8%
N. PUGET	2004	5.4%	14.7%	16.4%	15.5%	18.1%	27.9%	0.2%	1.8%
(92,724 acres)	2013	1.9%	9.3%	20.6%	17.0%	21.5%	27.6%	0.2%	1.9%
	2031	3.3%	2.7%	20.0%	16.1%	28.5%	26.8%	0.4%	2.2%
	2067	2.9%	1.9%	10.9%	8.8%	41.0%	28.1%	1.7%	4.7%
OESF	2004	5.2%	25.0%	29.6%	5.4%	6.4%	26.3%	0.7%	1.3%
(111,308 acres)	2013	0.6%	12.9%	36.6%	11.4%	9.8%	26.2%	0.7%	1.9%
	2031	2.1%	1.5%	30.7%	16.4%	20.3%	24.3%	2.5%	2.2%
	2067	3.2%	3.5%	14.9%	7.2%	40.3%	14.7%	6.8%	9.4%
S. COAST	2004	4.7%	13.8%	16.4%	26.7%	19.2%	19.1%	0.0%	0.1%
(80,966 acres)	2013	2.9%	6.0%	22.5%	26.2%	23.7%	18.5%	0.0%	0.1%
	2031	2.3%	1.9%	18.9%	25.9%	31.9%	19.0%	0.1%	0.1%
	2067	4.7%	1.4%	9.2%	18.4%	41.2%	23.3%	1.7%	0.1%
S. PUGET	2004	4.9%	15.2%	22.2%	14.2%	15.5%	27.9%	0.1%	0.0%
(34,606 acres)	2013	2.5%	11.7%	25.7%	16.1%	16.7%	27.2%	0.1%	0.0%
	2031	2.3%	2.2%	26.2%	17.2%	24.6%	27.1%	0.4%	0.0%
	2067	2.1%	1.5%	12.8%	8.2%	45.1%	28.7%	1.4%	0.2%
STRAITS	2004	4.9%	14.1%	18.1%	13.9%	20.8%	28.2%	0.1%	0.0%
(20,684 acres)	2013	3.2%	10.6%	21.8%	14.5%	22.5%	27.3%	0.1%	0.0%
	2031	4.1%	2.3%	23.0%	13.5%	29.8%	27.1%	0.2%	0.0%
	2067	3.1%	2.7%	12.4%	3.5%	48.6%	29.0%	0.5%	0.1%
Total (426,731	2004	5.0%	16.8%	21.6%	17.0%	13.8%	24.5%	0.3%	0.9%
acres)	2013	2.0%	9.7%	26.2%	19.5%	17.1%	24.1%	0.3%	1.1%
	2031	2.6%	2.0%	23.4%	20.3%	26.1%	23.6%	0.8%	1.2%
	2067	3.4%	2.2%	12.1%	11.7%	41.4%	22.7%	2.9%	3.7%

OESF = Olympic Experimental State Forest

Table D-10d. Percentage Distribution of Stand Development Stages in Riparian Areas under Alternative 4, by HCP Planning Unit and Year

HCP Planning Unit (Riparian Acres)	Year	Percent of Riparian Areas - Alternative 4							
		Ecosystem Initiation	Sapling Exclusion	Pole Exclusion	Large Tree Exclusion	Understory Development	Botanically Diverse	Niche Diversification	Fully Functioning
COLUMBIA	2004	4.5%	12.6%	22.3%	26.7%	11.4%	21.5%	0.2%	0.9%
(86,443 acres)	2013	1.0%	8.6%	23.8%	29.8%	14.4%	21.3%	0.2%	0.9%
	2031	0.9%	1.0%	20.6%	29.1%	25.8%	21.4%	0.3%	1.0%
	2067	1.4%	0.2%	8.5%	21.0%	43.1%	23.0%	1.6%	1.1%
N. PUGET	2004	5.2%	14.7%	16.5%	15.5%	18.1%	28.0%	0.2%	1.8%
(92,724 acres)	2013	1.5%	9.3%	20.7%	17.3%	21.3%	27.7%	0.2%	1.9%
	2031	1.1%	2.2%	20.2%	17.2%	29.1%	27.5%	0.4%	2.2%
	2067	1.2%	0.2%	7.7%	10.7%	44.7%	29.0%	1.7%	4.9%
OESF	2004	5.2%	25.0%	29.6%	5.4%	6.4%	26.3%	0.7%	1.3%
(111,308 acres)	2013	0.5%	12.8%	36.7%	11.5%	9.8%	26.2%	0.7%	1.9%
	2031	0.5%	1.6%	30.8%	16.8%	20.9%	24.7%	2.5%	2.2%
	2067	0.4%	0.3%	10.9%	7.9%	48.8%	15.0%	7.0%	9.5%
S. COAST	2004	4.7%	13.8%	16.4%	26.8%	19.2%	19.1%	0.0%	0.1%
(80,966 acres)	2013	1.0%	6.2%	22.4%	27.4%	24.0%	18.9%	0.0%	0.1%
	2031	1.4%	0.9%	18.7%	26.9%	32.7%	19.2%	0.1%	0.1%
	2067	1.8%	0.2%	4.1%	22.9%	43.9%	25.3%	1.6%	0.1%
S. PUGET	2004	4.4%	15.2%	22.3%	14.4%	15.6%	28.1%	0.1%	0.0%
(34,606 acres)	2013	0.6%	12.0%	25.8%	16.8%	16.7%	28.0%	0.1%	0.0%
	2031	0.7%	1.5%	26.0%	18.2%	25.5%	27.7%	0.5%	0.0%
	2067	1.0%	0.2%	10.6%	9.3%	48.0%	29.1%	1.6%	0.2%
STRAITS	2004	4.5%	14.1%	18.3%	14.0%	20.7%	28.3%	0.1%	0.0%
(20,684 acres)	2013	1.1%	10.5%	22.5%	15.3%	22.3%	28.1%	0.1%	0.0%
	2031	1.3%	1.3%	23.0%	15.0%	31.0%	28.2%	0.2%	0.0%
	2067	1.3%	0.2%	8.9%	3.8%	55.4%	29.6%	0.8%	0.1%
Total (426,731	2004	4.9%	16.8%	21.6%	17.1%	13.8%	24.6%	0.3%	0.9%
acres)	2013	1.0%	9.8%	26.3%	20.1%	17.1%	24.4%	0.3%	1.1%
	2031	0.9%	1.4%	23.4%	21.3%	26.8%	24.0%	0.9%	1.3%
	2067	1.1%	0.3%	8.3%	13.9%	46.1%	23.5%	3.0%	3.8%

OESF = Olympic Experimental State Forest

Table D-10e. Percentage Distribution of Stand Development Stages in Riparian Areas under Alternative 5, by HCP Planning Unit and Year

HCP Planning Unit (Riparian Acres)	Year	Percent of Riparian Areas - Alternative 5							
		Ecosystem Initiation	Sapling Exclusion	Pole Exclusion	Large Tree Exclusion	Understory Development	Botanically Diverse	Niche Diversification	Fully Functioning
COLUMBIA	2004	5.3%	13.1%	20.9%	26.6%	11.6%	21.4%	0.1%	0.8%
(86,443 acres)	2013	2.9%	9.1%	23.2%	28.6%	14.3%	20.9%	0.2%	0.8%
	2031	3.3%	1.9%	19.3%	27.6%	25.9%	21.0%	0.2%	0.8%
	2067	3.1%	2.0%	11.7%	15.7%	42.8%	22.4%	1.3%	0.9%
N. PUGET	2004	5.6%	14.4%	15.9%	15.6%	18.8%	28.4%	0.2%	1.2%
(92,724 acres)	2013	2.5%	8.7%	20.4%	16.8%	22.2%	27.7%	0.2%	1.5%
	2031	3.3%	2.7%	18.0%	16.2%	30.4%	27.1%	0.4%	1.9%
	2067	2.3%	1.7%	9.9%	7.5%	43.9%	30.8%	1.4%	2.4%
OESF	2004	5.5%	23.5%	30.1%	5.8%	6.9%	26.6%	0.7%	0.9%
(111,308 acres)	2013	2.2%	12.7%	34.9%	12.0%	10.3%	25.8%	0.7%	1.3%
	2031	2.8%	2.4%	29.8%	17.1%	19.9%	24.0%	2.1%	1.8%
	2067	2.9%	1.4%	18.0%	8.3%	40.8%	20.9%	4.7%	3.2%
S. COAST	2004	5.6%	13.2%	16.0%	27.1%	19.1%	18.9%	0.0%	0.1%
(80,966 acres)	2013	2.8%	6.0%	21.9%	26.8%	23.8%	18.6%	0.0%	0.1%
	2031	3.5%	1.3%	15.9%	26.9%	33.5%	18.8%	0.0%	0.1%
	2067	3.1%	1.6%	8.0%	14.8%	46.6%	24.1%	1.6%	0.1%
S. PUGET	2004	5.1%	14.7%	22.4%	14.4%	15.5%	27.9%	0.1%	0.0%
(34,606 acres)	2013	2.5%	10.2%	27.1%	16.2%	16.6%	27.3%	0.1%	0.0%
	2031	2.8%	2.1%	23.0%	17.8%	26.8%	27.1%	0.3%	0.0%
	2067	2.7%	1.5%	10.4%	7.8%	47.7%	28.4%	1.3%	0.2%
STRAITS	2004	5.1%	12.1%	19.9%	14.4%	20.3%	28.1%	0.1%	0.0%
(20,684 acres)	2013	3.2%	9.5%	23.2%	15.0%	21.7%	27.4%	0.1%	0.0%
	2031	2.9%	2.5%	21.4%	13.7%	31.7%	27.7%	0.2%	0.0%
	2067	4.0%	1.2%	8.9%	4.2%	52.3%	28.7%	0.7%	0.1%
Total (426,731	2004	5.5%	16.2%	21.3%	17.3%	14.1%	24.7%	0.3%	0.7%
acres)	2013	2.6%	9.5%	25.7%	19.7%	17.3%	24.1%	0.3%	0.8%
	2031	3.2%	2.1%	21.5%	20.8%	27.1%	23.5%	0.7%	1.1%
	2067	2.9%	1.6%	12.0%	10.6%	44.1%	24.9%	2.2%	1.6%

OESF = Olympic Experimental State Forest

Table D-10f. Percentage Distribution of Stand Development Stages in Riparian Areas under the Preferred Alternative, by HCP Planning Unit and Year

HCP Planning Unit (Riparian Acres)	Year	Percent of Riparian Areas - Preferred Alternative							
		Ecosystem Initiation	Sapling Exclusion	Pole Exclusion	Large Tree Exclusion	Understory Development	Botanically Diverse	Niche Diversification	Fully Functioning
COLUMBIA	2004	4.8%	12.4%	21.3%	26.6%	12.4%	21.5%	0.1%	0.9%
(86,443 acres)	2013	3.0%	8.6%	22.7%	28.1%	15.6%	20.8%	0.3%	0.9%
	2031	2.1%	3.0%	19.6%	23.0%	22.1%	18.9%	10.4%	0.9%
	2067	8.5%	1.7%	11.0%	15.3%	32.3%	17.1%	6.1%	7.9%
N. PUGET	2004	5.4%	14.2%	15.4%	14.8%	20.2%	28.6%	0.2%	1.3%
(92,724 acres)	2013	3.8%	9.3%	19.4%	15.2%	23.3%	27.3%	0.2%	1.5%
	2031	2.2%	4.6%	19.7%	12.9%	28.5%	25.6%	4.6%	1.9%
	2067	5.9%	1.2%	10.9%	7.6%	37.1%	26.3%	5.1%	5.9%
OESF	2004	5.5%	24.1%	29.4%	5.4%	7.2%	26.7%	0.7%	0.9%
(111,308 acres)	2013	4.3%	13.1%	34.5%	10.4%	10.2%	25.4%	0.6%	1.3%
	2031	3.7%	3.2%	30.6%	14.0%	19.9%	23.8%	2.9%	2.0%
	2067	7.9%	4.8%	16.7%	7.9%	33.0%	16.5%	6.4%	6.6%
S. COAST	2004	4.8%	13.4%	15.3%	26.0%	21.3%	19.1%	0.0%	0.1%
(80,966 acres)	2013	3.1%	6.3%	21.5%	23.4%	27.0%	18.4%	0.1%	0.1%
	2031	2.3%	4.3%	18.4%	18.6%	30.7%	17.2%	8.4%	0.1%
	2067	9.4%	1.0%	11.0%	15.5%	30.8%	16.1%	10.5%	5.8%
S. PUGET	2004	4.8%	14.7%	21.9%	14.2%	16.3%	28.1%	0.1%	0.0%
(34,606 acres)	2013	2.1%	11.7%	25.2%	14.9%	18.4%	27.6%	0.2%	0.0%
	2031	1.1%	2.8%	22.5%	14.6%	26.8%	25.4%	6.7%	0.0%
	2067	5.3%	1.2%	10.3%	6.1%	43.6%	24.2%	4.7%	4.5%
STRAITS	2004	5.0%	12.9%	18.9%	13.5%	21.4%	28.3%	0.1%	0.0%
(20,684 acres)	2013	3.4%	10.5%	21.2%	12.5%	24.9%	27.3%	0.1%	0.0%
	2031	3.1%	4.1%	22.0%	8.4%	26.9%	22.1%	13.4%	0.0%
	2067	9.3%	1.3%	11.3%	1.4%	39.6%	20.2%	7.1%	9.7%
Total (426,731	2004	5.1%	16.2%	20.9%	16.8%	15.2%	24.8%	0.3%	0.7%
acres)	2013	3.5%	9.8%	25.0%	18.0%	18.7%	23.8%	0.3%	0.9%
	2031	2.5%	3.7%	22.6%	16.2%	25.1%	22.0%	6.6%	1.1%
	2067	7.7%	2.2%	12.4%	10.3%	34.5%	19.5%	6.7%	6.5%

OESF = Olympic Experimental State Forest

D.4 ADDITIONAL ANALYSES FOR THE WILDLIFE SECTION

Tables D-11 through D-17 support discussions of effects to wildlife species and habitats.

Appendix D

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Table D-11. Status, Habitat Associations, and Distribution of Threatened, Endangered, and Sensitive Wildlife Species that May Occur on Western Washington Forested State Trust Lands

Species	Status[1/]	Habitat Association and Distribution [2/]
Mardon Skipper *Polites mardon*	SE FC	Open grasslands on glacial outwash prairies in the Puget lowlands; may occur in the South Puget and South Coast HCP Planning Units.
Oregon Silverspot Butterfly *Speyeria zerene hippolyta*	SE FT	Coastal grasslands with *Viola adunca* on the Long Beach peninsula.
Larch Mountain Salamander *Plethodon larselli*	SS FCo	Talus with organic debris, structurally complex forest; may occur in the North Puget, South Puget, and Columbia HCP Planning Units (Crisafulli 1999).
Oregon Spotted Frog *Rana pretiosa*	SE FC	Marshy ponds, streams, and lakes; three extant populations in the South Puget and Columbia HCP Planning Units (McAllister and Leonard 1997).
Northwestern Pond Turtle *Clemmys marmorata*	SE FCo	Marshes, sloughs, ponds, and nearby uplands; may occur in North Puget, South Puget, Columbia, and South Coast HCP Planning Units.
Common Loon *Gavia immer*	SS	Large wooded lakes with abundant fish; may occur in the North Puget, South Puget, South Coast, OESF, or Straits HCP Planning Units.
Aleutian Canada Goose *Branta canadensis leucopareia*	ST	Migrant or winter resident in lakes, ponds, wetlands, grasslands, or agricultural fields in southwest Washington or Puget lowlands.
Bald Eagle *Haliaeetus leucocephalus*	ST FT	Riparian and coastal areas, mature and old-growth forest within 1 mile of water; found in all HCP Planning Units.
Peregrine Falcon *Falco peregrinus*	SS FCo	Cliffs provide breeding habitat; foraging habitat includes wetlands and open habitats; found in all HCP Planning Units.
Sandhill Crane *Grus canadensis*	SE	Nests in extensive shallow marshes with dense emergent plant cover, forages in wet meadows and grasslands; may occur in the Columbia HCP Planning Unit.
Marbled Murrelet *Brachyramphus marmoratus*	ST FT	Structurally complex and old-growth forests; found in all HCP Planning Units, mostly within 40 miles of marine waters, maximum 52 miles inland.
Northern Spotted Owl *Strix occidentalis caurina*	SE FT	Structurally complex and old-growth forests; found in all HCP Planning Units.
Western Gray Squirrel *Sciurus griseus*	ST FCo	Closed-canopy white-oak/Douglas-fir or oak/ponderosa pine forest; may occur in the South Puget and Columbia HCP Planning Units.
Gray Wolf *Canis lupus*	SE FT	Areas with an ungulate prey base and low levels of human activity; may occur in North Puget, South Puget, and Columbia HCP Planning Units.
Grizzly Bear *Ursus arctos*	SE FT	Areas with low levels of human activity; may occur in North Puget and South Puget HCP Planning Units.
Pacific Fisher *Martes pennanti*	SE FCo	Structurally complex forest, especially at low to moderate elevations; may occur in all HCP Planning Units, although extensive surveys have resulted in no detections (Lewis and Stinson 1998).
Canada Lynx *Lynx canadensis*	ST FT	Subalpine fir vegetation and interspersed patches of other forest types, generally above 4,000 feet elevation (Ruediger et al. 2000); may occur in North Puget, South Puget, and Columbia HCP Planning Units.
Columbian White-Tailed Deer *Odocoileus virginianus leucurus*	SE FE	Bottomland riparian forests, grassland, and agricultural lands along an 18-mile stretch of the Columbia River.

1/ SE = State Endangered; ST = State Threatened; SS = State Sensitive; FE = Federal Endangered; FT = Federal Threatened; FCo = Federal Species of Concern

2/ Unless otherwise indicated, all distribution and habitat association information is drawn from the HCP.

HCP = Habitat Conservation Plan, OESF = Oregon Experimental State Forest

Table D-12. Estimated Proportion of Western Washington Forested State Trust Lands in Different Forest Habitat Types under Each Alternative

Forest Type	Alternative	2004[1/]	2013	2031	2067
Ecosystem Initiation	1	8%	7%	6%	9%
	2	8%	9%	8%	10%
	3	7%	11%	10%	11%
	4	7%	5%	8%	8%
	5	10%	12%	13%	11%
	PA	8%	13%	8%	11%
Competitive Exclusion	1	68%	70%	70%	65%
	2	68%	69%	69%	64%
	3	68%	67%	67%	64%
	4	68%	71%	69%	65%
	5	66%	67%	66%	65%
	PA	68%	66%	65%	60%
Structurally Complex	1	25%	23%	24%	27%
	2	24%	22%	23%	26%
	3	24%	22%	22%	25%
	4	25%	23%	23%	27%
	5	24%	21%	21%	23%
	PA	24%	22%	26%	29%

Source: DNR Alternative modeling output data

1/ Model runs used to estimate the future availability of different forest structure classes under the Alternatives were started in 2001 to "clean" the inventory of sales sold between 2001 and 2003. In addition, the models for Alternative 5 and the Preferred Alternative used a different method than the other Alternatives for calculating yield (which was used as the basis for determining forest structure classes). The models for Alternative 5 and the Preferred Alternative used value-based yield tables, whereas those for Alternatives 1 through 4 were volume-based. These two factors account for the differences in Year 2004 values among the Alternatives. Notwithstanding the dissimilar starting points, the differences among the general trends in the rates at which the amount of the forest structure classes change provides a basis for comparing the effects of the Alternatives.

PA = Preferred Alternative

Table D-13. Estimate of Percent Change from the Current Amount of Spotted Owl Dispersal Habitat under Each Alternative

Alternative	2013	2031	2067
1	– 6	– 3	+ 9
2	– 10	– 6	+ 8
3	– 11	– 8	+ 3
4	– 5	– 6	+ 10
5	– 11	– 11	– 1
PA	– 11	+ 8	+ 18

Source: DNR Alternative modeling output data

Note: The current amount of dispersal habitat does not refer to designated dispersal habitat, but rather uses the structurally complex forest structure as surrogate.

PA = Preferred Alternative

Table D-14. Estimated Proportion of Western Washington Forested State Trust Lands Comprising Structurally Complex Forest Relative to Total Forested Trust Lands under Each Alternative over Time

Alternative	Acres of Structurally Complex Forest				Percentage			
	2004[1/]	2013	2031	2067	2004[1/]	2013	2031	2067
1	340,841	319,127	329,133	371,003	25%	23%	24%	27%
2	339,728	307,371	321,042	366,358	24%	22%	23%	26%
3	339,667	300,674	311,273	348,670	24%	22%	22%	25%
4	342,026	326,583	321,895	377,794	25%	23%	23%	27%
5	331,215	294,211	294,619	326,788	24%	21%	21%	23%
PA	338,212	300,819	365,015	398,464	24%	22%	26%	29%

Source: DNR Alternative modeling output data

1/ Model runs used to estimate the future availability of different forest structure classes under the Alternatives were started in 2001 to "clean" the inventory of sales sold between 2001 and 2003. In addition, the models for Alternatives 5 and the Preferred Alternative used a different method than the other Alternatives for calculating yield (which was used as the basis for determining forest structure classes). The models for Alternative 5 and the Preferred Alternative used value-based yield tables, whereas those for Alternatives 1 through 4 were volume-based. These two factors account for the differences in Year 2004 values among the Alternatives. Notwithstanding the dissimilar starting points, the differences among the general trends in the rates at which the amount of the forest structure classes change provides a basis for comparing the effects of the Alternatives.

Table D-15. Estimated Proportion of Low-Elevation[1/] Western Washington Forested State Trust Lands Comprising Structurally Complex Forest Relative to Total Forested Trust Lands under Each Alternative over Time

Alternative	Low-Elevation			
	2004[2/]	2013	2031	2067
1	19%	18%	18%	21%
2	19%	17%	18%	21%
3	19%	16%	17%	20%
4	19%	18%	18%	21%
5	19%	16%	17%	19%
PA	19%	17%	21%	23%

Source: DNR Alternative modeling output data

1/ Defined as lands in the western hemlock or Sitka spruce vegetation zones. Note that, in contrast with how this table was calculated in the Draft Environmental Impact Statement, this information was not compiled by selecting Watershed Administrative Units (WAUs) that met certain criteria, but by applying the vegetation zone cover without regard for where it fell within a WAU.

2/ Model runs used to estimate the future availability of different forest structure classes under the Alternatives were started in 2001 to "clean" the inventory of sales sold between 2001 and 2003. In addition, the models for Alternative 5 and the Preferred Alternative used a different method than the other Alternatives for calculating yield (which was used as the basis for determining forest structure classes). The models for Alternative 5 and the Preferred Alternative used value-based yield tables, whereas those for Alternatives 1 through 4 were volume-based. These two factors account for the differences in Year 2004 values among the Alternatives. Notwithstanding the dissimilar starting points, the differences among the general trends in the rates at which the amount of the forest structure classes change provide a basis for comparing the effects of the Alternatives.

PA = Preferred Alternative

Table D-16. Estimated Proportion of Structurally Complex Forest within 40 Miles of Marine Waters Relative to all Western Washington Forested State Trust Lands under Each Alternative over Time

	Percent of Structurally Complex Forest Within 40 miles of Marine Waters			
Alternative	**2004 [1/]**	**2013**	**2031**	**2067**
1	21%	19%	20%	23%
2	21%	19%	19%	22%
3	21%	18%	19%	21%
4	21%	20%	19%	23%
5	20%	18%	18%	20%
PA	21%	18%	22%	24%

Source: DNR Alternative modeling output data

1/ Model runs used to estimate the future availability of different forest structure classes under the Alternatives were started in 2001 to "clean" the inventory of sales sold between 2001 and 2003. In addition, the models for Alternative 5 and the Preferred Alternative used a different method than the other Alternatives for calculating yield (which was used as the basis for determining forest structure classes). The models for Alternative 5 and the Preferred Alternative used value-based yield tables, whereas those for Alternatives 1 through 4 were volume-based. These two factors account for the differences in Year 2004 values among the Alternatives. Notwithstanding the dissimilar starting points, the differences among the general trends in the rates at which the amount of the forest structure classes change provide a basis for comparing the effects of the Alternatives.

Table D-17 Average Proportion of Western Washington Forested State Trust Lands Harvested by Decade Within 10 Watersheds Identified as Containing Suitable Canada Lynx Habitat[1/]

Decade	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	PA
1	5.3%	4.9%	3.0%	6.0%	4.8%	6.1%
2	3.2%	4.4%	5.2%	5.3%	7.1%	3.3%
3	3.1%	4.1%	5.6%	6.2%	8.4%	2.4%
4	3.1%	3.7%	5.1%	5.0%	4.9%	3.4%
5	4.9%	7.2%	7.9%	6.8%	8.9%	5.4%
6	4.4%	6.6%	8.4%	5.6%	3.1%	4.6%
7	1.0%	3.1%	2.7%	1.1%	1.7%	1.7%
Average Decadal Harvest	3.6%	4.9%	5.4%	5.1%	5.6%	3.8%

PA = Preferred Alternative

[1/] A total of 10 watersheds (all in the North Puget HCP Planning Unit) met the criterion used to assess potential Canada lynx habitat of greater than 1 percent forested trust lands in the alpine or parkland vegetative zone.

Data Source: Model output data – timber flow levels

Appendix D

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D.5 LIST OF SURFACE WATER SEGMENTS

As of 1998, segments of the following surface waters were included in the 303(d) list prepared by the Washington Department of Ecology because pollutants impair beneficial uses of these waters (Department of Ecology 2003).

Abernathy Creek
Alder Creek
Allen Creek
Anderson Creek
Bagley Creek
Baird Creek
Barker Creek
Bear Creek
Bear Creek
Beaver Creek
Bertrand Creek
Berwick Creek
Big Beef Creek
Big Quilcene River
Big Soos Creek
Black Creek
Blackjack Creek
Bogachiel River
Boulder Creek
Boyce Creek
Burley Creek
Burnt Bridge Creek
Campbell Creek
Canyon Creek
Carpenter Creek
Cassalery Creek
Cavanaugh Creek
Cedar River
Chambers Creek
Chehalis River
Chimacum Creek
Church Creek
Cispus River
Clallam River
Clarks Creek
Clear Creek
Clearwater River
Clover Creek
Coal Creek
Columbia River
Cornell Creek
Cougar Canyon
Coweman River
Cowlitz River
Crisp Creek
Cumberland Creek
Curtin Creek
Day Creek
Deep Creek
Deer Creek
Dempsey Creek
Des Moines Creek
Deschutes River
Dillenbaugh Creek
Dry Creek
Dungeness River
Duwamish Waterway
East Canyon Creek
East Fork Dickey River
East Fork Lewis River
East Fork Nookachamps Creek
East Fork North River
East Fork Wildcat Creek
Eaton Creek
Elk Creek
Elkhorn Creek
Elochoman River
Elwha River
Evans Creek
Fifth Plain Creek
Finney Creek
Fishtrap Creek
Fork Creek
Fox Creek
French Creek
Friday Creek

Gaddis Creek
Gale Creek
Gallop Creek
Germany Creek
Goldborough Creek
Gorst Creek
Grandy Creek
Green Creek
Greenwater River
Hansen Creek
Harrington Creek
Harvey Creek
Hat Slough
Hatchery Creek
Honey Dew Creek
Howard Creek
Huge Creek
Humptulips River
Hylebos Creek
Native American Creek
Issaquah Creek
Jackman Creek
Jackson Creek
Jenkins Creek
Jim Creek
Joe Creek
Johnson Creek
Kalaloch Creek
Kalama River
Kennedy Creek
Kings Creek
Lacamas Creek
Leland Creek
Lincoln Creek
Little Deer Creek
Little Hoko River
Little Quilcene River
Little Soos Creek
Lockwood Creek
Lummi River
Lyon Creek
Mannser Creek
Maple Creek
Marple Creek
Matney Creek
Matriotti Creek
Maxfield Creek
May Creek
McAleer Creek
McAllister Creek
McClane Creek
McCormick Creek
Mercer Slough
Middle Fork Dickey River
Middle Fork Nooksack River
Middle Fork Quilceda Creek
Mill Creek
Minter Creek
Morey Creek
Muck Creek
Mulholland Creek
Naselle River
Newaukum Creek
Nisqually River
Nolan Creek
Nookachamps Creek
Nooksack River
North Creek
North Fork Cispus River
North Fork Clover Creek
North Fork Crooked Creek
North Fork Goble Creek
North Fork Issaquah Creek
North Fork Nooksack River
North Fork Sekiu River
North Fork Skokomish River
North Fork Stillaguamish River
North River
Owl Creek
Panther Creek
Pepin Creek
Perry Creek
Pigeon Creek
Pilchuck Creek
Portage Creek
Purdy Creek

Puyallup River
Quilceda Creek
Rabbit Creek
Racehorse Creek
Raging River
Rattlesnake Creek
Reichel Creek
Ripley Creek
Roaring Creek
Rock Creek
Salmon Creek
Salzer Creek
Samish River
Sammamish River
Scatter Creek
Schneider Creek
Sekiu River
Shanghai Creek
Shelton Creek
Shoofly Creek
Silver Creek
Simons Creek
Skagit River
Skokomish River
Skookum Creek
Skookumchuck River
Skykomish River
Smith Creek
Snohomish River
Snoqualmie River
Soleduck River
Sorenson Creek
South Fork Dakota Creek
South Fork Hoh River
South Fork Nooksack River
South Fork Sekiu River
South Fork Skagit River
South Fork Snoqualmie River
South Fork Stillaguamish River
South Prairie Creek
Sponenbergh Creek
Squaw Creek
Squire Creek
Stavis Creek
Stevens Creek
Stickney Slough
Stillaguamish River
Stimson Creek
Sumas River
Swamp Creek
Swan Creek
Tarboo Creek
Thorndike Creek
Thornton Creek
Tibbetts Creek
Tower Creek
Turner Creek
Union River
Voight Creek
Wapato Creek
Weaver Creek
West Branch Big Soos Creek
West Fork Dickey River
West Fork Woods Creek
Whatcom Creek
White River
White Salmon River
Wiley Slough
Wilkeson Creek
Willapa River
Willoughby Creek
Winfield Creek
Woodland Creek
Woods Creek
Woodward Creek
Wynoochee River
Yacolt Creek

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D.6 POTENTIAL EFFECTS OF THE PROPOSED ALTERNATIVES ON SEDIMENT DELIVERY

The amount of sediment that reaches a stream depends primarily on two processes: the availability of sediment and the ability of sediment to travel from its source to the stream. Sediment is produced through mass wasting and surface erosion, as described in Section 4.6, Geomorphology, Soils and Sediment, and in Section 4.15, Cumulative Effects. Mass wasting is not expected to increase as a result of implementation of any of the Alternatives; however, increased harvest would increase the risk of surface erosion from road use and other harvest-related activities.

The ability of sediment to travel from its source to streams could be affected through changes in harvest in riparian areas. In general, the vegetation in riparian areas serves as a filter, removing sediment before it reaches a water body. In most cases, vegetation immediately adjacent to a stream channel is most important in maintaining bank integrity (Forest Ecosystem Management Assessment Team 1993). Protection of stream bank integrity, and adequate soil filtering of surface erosion is generally maintained with a fully functioning stand within 30 feet of a stream. Other than restoration activities, roads, and yarding corridors, none of the Alternatives proposes activities within the 25-foot no-harvest zone. The adjoining 75 feet is the minimal-harvest zone that would include restricted activities that vary between Alternatives. This level of Riparian Management Zone protection reduces the differences in sediment delivery between Alternatives.

Appendix D

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D.7 ARCHAEOLOGICAL OVERVIEW OF WESTERN WASHINGTON

The first human occupation of the state of Washington may date back about 14,000 years to the Manis Mastodon site at Sequim, where a possible bone point and the spirally fractured bones of an extinct relative of the elephant indicate possible human hunting and butchering. (Dates given here are in calendric years, based on approximate calibration of radiocarbon ages.) Artifacts of the Clovis culture, which dates between 13,000 and 13,500 years ago elsewhere in North America, have been found on the ground surface in such places as Thurston County and Whidbey Island, but no campsite of this culture has yet been found in Washington. This early culture is generally believed to have relied heavily on big game for subsistence, although there is evidence they consumed a more diverse diet that also included plants and smaller animals.

The post-Clovis prehistory of western Washington has been divided into three periods, designated simply as early, middle, and late. The early period, which lasted from approximately 12,000 to 7,000 years ago, includes the Proto-Western and Old Cordilleran Traditions (Matson and Copeland 1995). (Old Cordilleran is called "Olcott" in the Puget Sound and Straits HCP Planning Units, and Cascade in the Columbia HCP Planning Unit and at other high mountain sites where a greater likeness is seen to cultures east of the Cascades.) Sites left by these traditions typically occur on high marine and river terraces, sometimes at a significant distance from modern water courses, and consist of concentrations of cobble cores, flakes, large ovate knives, and broad-stemmed and leaf-shaped projectile points (Wessen 1990). Sites of both traditions occur near the saltwater coastline and larger river valleys in all HCP Planning Units. In the South Puget, Straits, and Columbia HCP Planning Units, they also have been documented along mountain streams in open sites, rockshelters, and caves (Wessen and Stilson 1986; Lewarch and Benson 1989). Because of an apparent inland focus, the people of this era are thought to have been more oriented to land animal hunting and less to marine and fish resources. Finds at nearby sites in British Columbia, northern Oregon, and eastern Washington, however, show that people also exploited aquatic resources during this early time period.

The middle period, lasting from 7,000 to 3,500 years ago sees a continuation of the Old Cordilleran Tradition until around 4,500 years ago, but few sites can be attributed to this time interval (Morgan 1999). Sites dating after 4,500 are more common and are technologically more complex. The focus of subsistence activity seems to have changed from terrestrial to marine resources, and most sites appear along the coasts or major river systems. The oldest shell midden sites thus far found in the region date to this period. Little evidence of activity is found in the higher mountains. Tools are more complex, including tools and ornaments of bone and antler along with chipped stone. On the basis of work at West Point, one of the few well-studied sites of this era, the lifestyle is interpreted as highly mobile and oriented to foraging for seasonally available foods with little emphasis on mass harvesting or food storage (Larson and Lewarch 1995).

The concentration on aquatic resources intensified during the late period (3,500 to 150 years ago), and the number and diversity of sites increased markedly. People maintained permanent villages on the coast and along the lower reaches of inland rivers. They used these villages as home bases and storage warehouses for food amassed during systematic

fish, game, and plant harvesting throughout the warm seasons. Huge shell middens were built up at some villages and at the best clam beaches. Cemeteries and petroglyph sites are often associated with village and midden sites and fishing camps and occur occasionally in higher montane settings. Blazed cedars, stripped of bark for basketry or with planks removed from their living trunks, can still be found throughout the lowlands. Small open camps left by hunters, fishers, plant gatherers, and traders have been found from the lowlands well into the subalpine zone of the mountains, but usually remain close to larger, permanent sources of water. The camps typically are concentrated along trade routes that linked communities living east and west of the Cascades. People usually strayed from larger streams and lakes only in the larger prairies of the lowlands, such as those around Fort Lewis and Sequim (Morgan 1999), in the huckleberry fields of the uplands, and near natural outcroppings of favored tool stone. Open, temporary camps, manifest as lithic scatters, are common in these settings. Extensive evidence of late period huckleberry processing has been documented in the sub alpine forests of the Columbia HCP Planning Unit, where they occur as shallow, charcoal-filled trenches (Mack and McClure 2002). Ethnographic reports indicate such sites should also be expected to occur in the South Puget Sound HCP Planning Unit (Larson 1988).

D.7.1 Ethnographic Overview of Western Washington

Historic native cultures of the region can generally be seen as a continuation of the lifeways indicated by late period archaeological sites. The people of this region belonged to five linguistic groups: Wakashan, Salishan, Chimakuan, Chinookan, and Sahaptian. Wakashan, Chinookan, Chimakuan, and most Salishan peoples were marine oriented, occupying villages on the major rivers or saltwater shorelines and focusing on shellfish and salmon and/or saltwater fish for their subsistence. These peoples abandoned their villages in summer, moving among fishing sites, and hunting, root-gathering, and berrying camps in mountains and prairies (Haeberlin and Gunther 1930). The Salishan Snoqualmie and the Sahaptian-speaking Klikitat differed, spending most of their time in foothill and mountain settings, where they emphasized hunting, berrying, and root-gathering, and served as intermediaries in the transmontane trade.

For all groups, forests provided many raw materials, including bark for baskets, planks for housing, and plants for medical uses, as well as subsistence resources (Gunther 1973). To maintain game and berry supplies, people regularly fired prairies and subalpine forests to keep plant communities at earlier successional stages. Forests also provided solitude that was necessary for individuals' quests for personal spirit helpers. This quest for spiritual guidance began at around puberty and continued throughout a person's life (Haeberlin and Gunther 1930).

Today, Native American tribes maintain a strong interest in Washington's upland forests, exercising rights guaranteed by treaty (Table D-18). Their members continue to fish at usual and accustomed places; hunt big game; and collect berries, bark, and medicinal plants. Some tribal people maintain the tradition of fasting for spiritual guidance and so continue to require the solitude of older, isolated forest lands. Tribes hold many landscape features to be sacred or at least important to the continued practice of their traditional cultures.

Table D-18. Major Native American Tribes Associated with the HCP Planning Units in Western Washington

HCP Planning Unit	Major Tribes
Columbia	Chinook, Yakama
South Coast	Shoalwater Bay Chinook, Chehalis, Quinault
Straits	Makah, Lower Elwah, Jamestown, Port Gamble S'Klallum
Olympic Experimental State Forest	Makah, Quileute, Hoh, Quinault, S'Klallum groups
North Puget	Nooksack, Lummi, Swinomish, SaukSuiattle, Stillaguamish, Tulalip, Muckleshoot
South Puget	Suquamish, Muckleshoot, Puyallup, Nisqually, Squaxin Island, Skokomish

D.7.2 Overview of Regional History

Washington's coastline was first charted and described by English and American explorers in the last decades of the eighteenth century. Fur traders, primarily associated with Hudson's Bay Company posts at Vancouver and Nisqually, traveled into the interior in the first half of the nineteenth century. Except for the increasing presence of beads, metal, and other trade goods among the local Native American tribes, however, they left few traces outside their fort compounds. By the 1830s, the Hudson's Bay Company had expanded into agricultural production, maintaining large farms in the lowlands around Forts Vancouver and Nisqually and in the lower Cowlitz. Settlers, some drawn by the promise of farmland, but most coming to exploit the region's timber and mineral wealth began flowing into the lowlands of the South Puget and Columbia HCP Planning Units by the late 1840s. In the upland areas that include most of the forested trust lands, their principal interests were coal and timber (Avery 1965).

Mining has left its traces throughout the uplands of western Washington. Although the Cascade Mountains contain a variety of gems and minerals, their most abundant mineral resource is coal. Coal was discovered in the vicinity of Seattle in 1853 and, by the early 1860s, veins had been documented in the Cascade foothills of the North and South Puget HCP Planning Units from Bellingham Bay to Olympia. In addition to large, open pit mines and haul roads, traces of past mining occur as mining prospects, mine shafts, and miners' camps.

Timber has always been the premier natural resource of the region and continues to be the focus of resource management on forested trust lands. When the region's timber industry began in the 1850s, loggers first focused on large trees close to coastlines and the banks of larger streams, which enabled them to float logs to lumber mills. Once this easily extracted timber had been cut, loggers used teams of oxen to haul logs to water along wooden skid roads. Such roads can still be found in boggy soils along streams, where the moisture and soil acidity have preserved them. By the 1880s, steam engines, including locomotives and steam donkeys, came into use and logs were transported on flatcars that ran on wooden rails. By the beginning of the 20th century, most of the timber in lowland and foothill settings had been cut and operations moved into higher

mountains, using locomotives on steel rails and later trucks on logging roads to extract their product (Avery 1965).

In addition to skid roads, sites associated with logging include railroad grades and tracks, trestles, construction and logging camps, stumps cut with springboard notches, and a variety of equipment. It is a paradox of the long-term planning process that in some plots with a long duration between harvests, artifacts and structures left by the loggers who make the first harvest will be more than 50 years old and thus potential cultural resources before the second harvest is made.

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Appendix D

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